

*A webcomic of romance, sarcasm,  
math, and language*

**xkcd**

**RANDALL MUNROE**

**2007**

**xkcd**

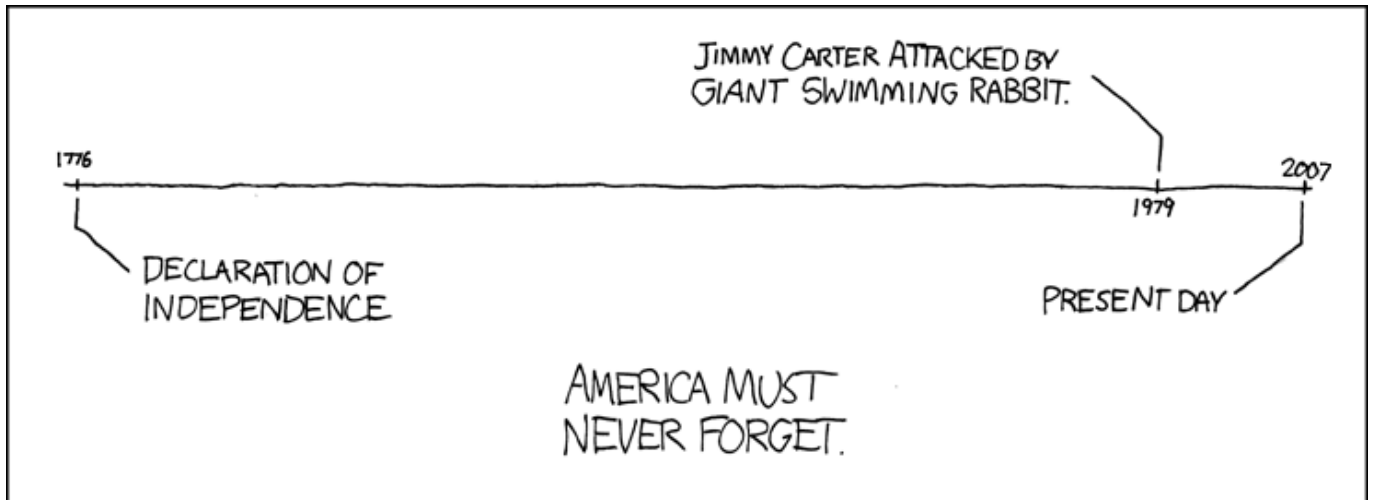
**2007**

a collection of 161 webcomics

from #204 to #364

*by Randall Munroe*

## #204: America



The younger folk in the audience think this is a joke.

### Explanation:

On April 20, 1979, U.S. President Jimmy Carter was allegedly "attacked by a giant swimming rabbit" while solo-fishing on a boat in his hometown. The reality is a little more nuanced: According to Carter, the rabbit had actually been chased into the water by some hounds and swam near his boat. Carter splashed some water on it to compel the rabbit not to come any closer.

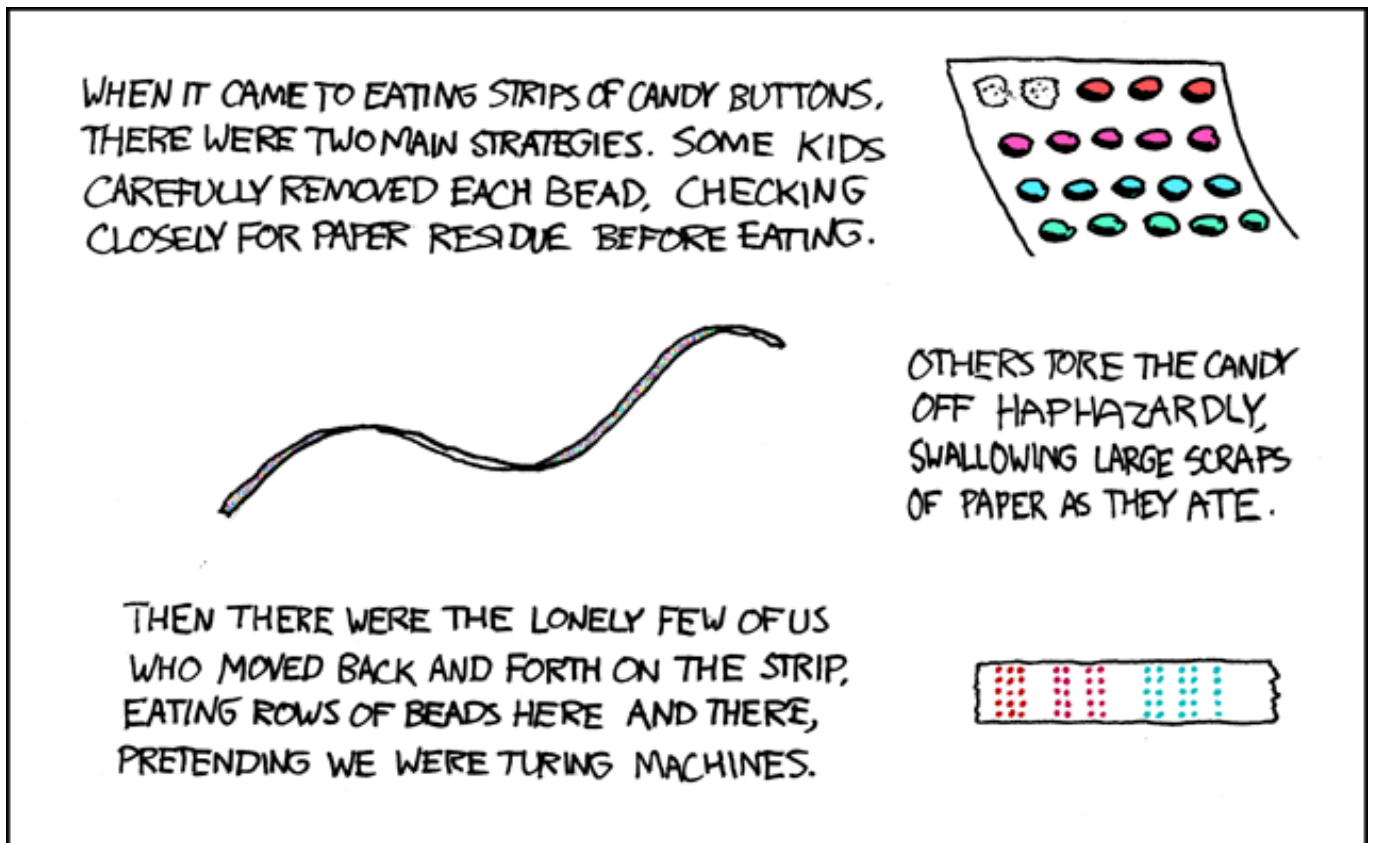
Nevertheless, the newspapers ate it up, reveling in the ridiculous notion that anyone would feel threatened by a rabbit (considered by some to be small, harmless herbivores)[citation needed], with The Washington Post putting the story "President Attacked by Rabbit" on the front page. Since the White House refused to release the photograph, the paper created a cartoon parody of the rabbit, calling it PAWS, in reference to the blockbuster film JAWS, about a killer shark. Carter's opponents used it as fodder for their arguments that Carter's presidency was weak and ineffectual, and basically, the whole thing was blown way out of proportion by the American media, as so often happens with goofy events such as this.

This comic treats the Killer Rabbit attack as a dark day for the United States and uses the phrase "America Must Never Forget," which usually applies to days like the Pearl Harbor attack or 9/11. It essentially claims that, for the entire history of the United States (which starts with the signing of the Declaration of Independence), it is the only event worth remembering.

The rabbit incident is also referenced in 1688: Map Age Guide and in 2086: History Department.

The title text is an assumption that the event has not been remembered in the way the comic jokes that it should have been, and as a result, younger readers will think he is kidding when he says Carter was attacked by a rabbit.

## #205: Candy Button Paper



Nonrewritable tape?

### Explanation:

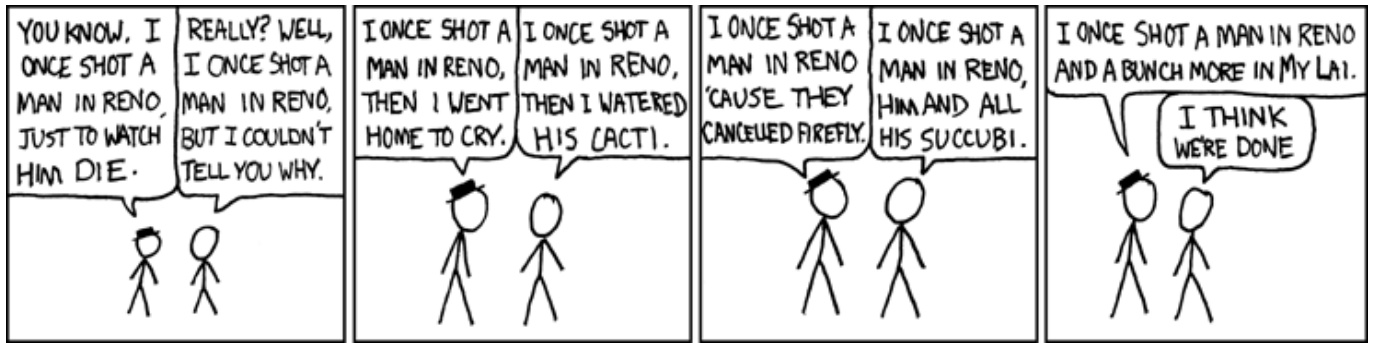
This comic refers to Candy Buttons, a type of candy sold by Necco in the U.S. since 1980. Because they were glued to paper, each candy button would have some paper stuck to it. As said in the comic, some kids would carefully check each candy button to make sure they would not accidentally eat paper, while some kids didn't care and ripped them off, eating large scraps of paper in the process.

Because of the resemblance of the strips of paper to the tape of a Turing Machine, a small minority of children (possibly only Randall or some of his friends) pretended to be a Turing Machine by creating rules and executing them upon the tape of candy exactly like a real Turing Machine would do.

The title text refers to the fact that, although it would be hypothetically possible to create a Turing Machine that can only delete symbols, the information density of the tape would be greatly reduced, and the original Turing Machine could read and write from the tape it operated on.



## #206: Reno Rhymes



Did you shoot a man in Reno? Now, I don't mean to pry.

### Explanation:

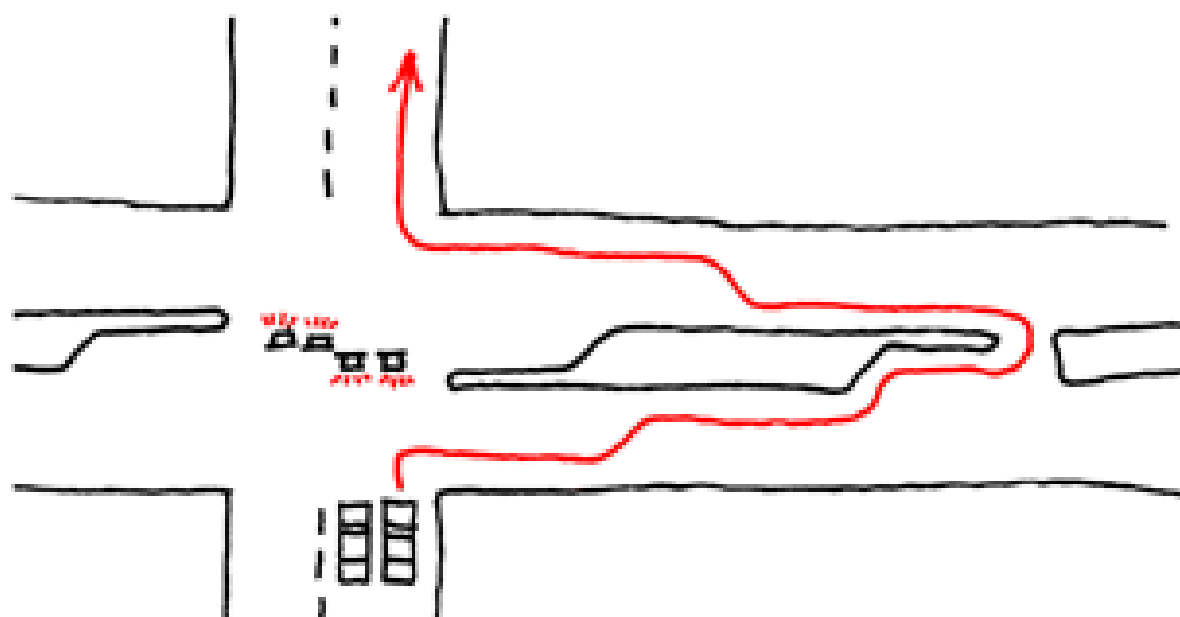
This comic starts with a line from the song "Folsom Prison Blues" by Johnny Cash. Cash is noted as saying, "I sat with my pen in my hand, trying to think up the worst reason a person could have for killing another person, and that's what came to mind," which fits pretty well with the personality of Black Hat. Rather than react badly, Cueball starts a rhyming game, which they continue until Black Hat refers to the horrifying My Lai Massacre, which is apparently going too far for Cueball.

The title text continues the rhyme, but changes the roles: now the speaker is asking someone else if they shot a man in Reno. It may be a reference to *The Princess Bride* (Inigo says the "I don't mean to pry" part to Westley).

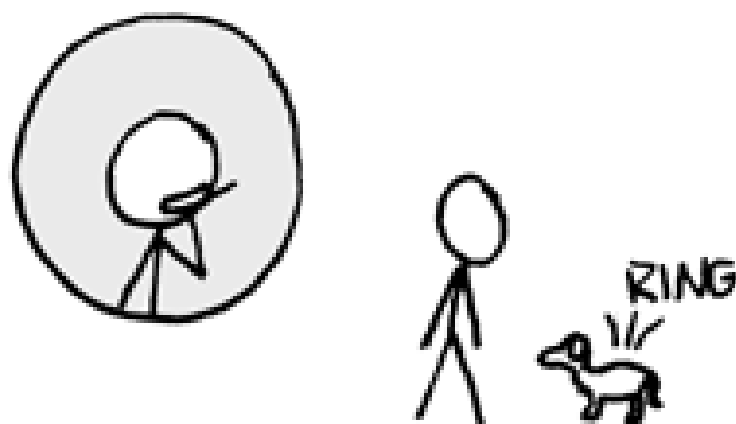
## **#207: What xkcd Means**

# WHAT DOES XKCD MEAN?

IT MEANS SAVING A FEW SECONDS AT A LONG RED LIGHT VIA ELABORATE AND QUESTIONABLY LEGAL MANEUVERS.



IT MEANS HAVING SOMEONE CALL YOUR CELL PHONE TO FIGURE OUT WHERE IT IS.



IT MEANS CALLING THE ACKERMANN FUNCTION WITH GRAHAM'S NUMBER AS THE ARGUMENTS JUST TO HAPPENLY MATHEMATICIANS

It means shuffling quickly past nuns on the street with ketchup in your palms, pretending you're hiding stigmata.

## Explanation:

This comic purports to finally answer the question, "What does xkcd mean?" However, instead of giving an answer as to what the letters actually mean (see below), he offers five quirky behaviors that he says represent the meaning of the word. This is reminiscent of TV commercials that ask, "What does [brand name] mean? It means [happy activity]!"

- The first panel shows a driver, marked by a red line, making a right turn at a red light, a U-turn on the connecting road, and then another right turn, returning them to their original direction presumably faster than waiting for the light. Right turns at red lights and U-turns are legal in all 50 states, but some intersections do not allow them (and turning at a red light is illegal everywhere in Europe, except for if the traffic lights have been fitted with an auxilliary green arrow which indicates such an allowance during a road junction's sequence). Hence, this complicated maneuver is "questionably legal". However, under certain circumstances in the US state of Oregon, it appears that this is actually legal.

- The second panel shows Cueball searching for his mobile phone by having his friend call it to locate the ringtone, only to hear a ring from inside of his dog's stomach, possibly a reference to Jurassic Park III.[citation needed] This, by the way, is a weird depiction. Usually this is done by someone with or close to you. Because if Cueball didn't have his phone, then how could he get someone outside the house to call it? Having someone you meet call your phone, presumably to find it, is used in 2900: Call My Cell, although it turned out it was not really about finding the phone, rather, Black Hat showing his inner classhole.

- The third panel discusses calling an Ackermann function using Graham's number as input arguments to horrify mathematicians, where Graham's number is a (very) large number (once celebrated as the largest number ever used in a proof, although it is no longer the record holder), and the Ackermann function is a (very) fast-growing function, thus the function's output must be insanely large. (In fact,  $A(g_{64}, g_{64})$  is actually smaller than  $g_{65}$ .)

- The fourth panel describes how walking in a specific pattern on a tile floor based on arbitrary rules related to the position of the black and white tiles will cause someone to be unable to walk normally on a tile floor ever again. This is further referenced in 245: Floor Tiles.

- The title text refers to stigmata, marks corresponding to Jesus' crucifixion wounds. They are also sometimes reported to bleed periodically. Using ketchup to fake stigmata would be a good idea, as from afar people would think that you actually are bleeding from your (supposed) stigmata. Devout Catholics have claimed to have spontaneously developed stigmata.

According to the xkcd FAQ and Randall Munroe himself, the name xkcd doesn't stand for anything. He says it originated as a previously unused random four-letter string which he used as his username on various internet services. There are other theories about what xkcd might stand for:

- If each letter of the alphabet is mapped to 1 through 26, the sum of the values for "x", "k", "c", and "d" is equal to 42, which is the answer given to the Ultimate Question of Life, The Universe, and Everything by the supercomputer in The Hitchhiker's Guide to the Galaxy. However, according to Randall himself, this is a coincidence.[actual citation needed]
- A now-deleted Reddit account noted that typing "xkcd" on a Persian QWERTY keyboard returns "", which means satirical, sarcastic, and comic.
- "X", "k", "c", and "d" are consecutive letters when typed on a left-handed Dvorak keyboard.

## #208: Regular Expressions



Wait, forgot to escape a space. Wheeeeeee[taptaptap]eeeeee.

### Explanation:

The comic begins with Randall saying how every time he develops a new skill, he finds himself daydreaming about using it to save the day. Computer skills aren't usually superhero material, which lends itself to the humor of the comic. In computing, a regular expression ("regex") provides a concise and flexible means to "match" (specify and recognize) strings of text, such as particular characters, words, or patterns of characters. Manually trying to look for a specific pattern through 200 MB of text is equivalent to looking for a needle in a haystack. But this task can be made easy by using regexes, since a script can read through text and match specific string patterns much faster than humans

can achieve. Perl is a popular scripting language that has often been referenced favorably in the comic. Perl is also the most acknowledged language when it comes to the performance while evaluating regular expressions. The "PERL!" in the fifth panel is reminiscent of old superhero serials, particularly Batman (TV series), in which sound effects such as "BAM!" "POW!" "ZAP!" would be displayed on screen in similar spiky bubbles. This fits with the theme of the comic, with Cueball being a "superhero" who fights crime using computer skills.

The title text refers to how sensitive regexes can be to small mistakes or missing characters. In 1168: tar, another potential hero fails (and gets blown up by a nuclear bomb that is only able to be disarmed by typing in a valid tar command, but blows up if you don't do it on the first try) because the syntax of some commands and programming languages are just too difficult to remember by heart.

## #209: Kayak



Man, there's future \*everywhere\*.

### Explanation:

This comic deals with two linked themes, which both come under the umbrella of existentialism, a branch of philosophy.

Beret Guy invites Cueball to join him in a two-seat kayak trip. However, Cueball is confused by his intention.

Beret Guy initially words his invitation to Cueball as "come explore the future." However, this confuses Cueball, as he believes that Beret Guy's kayak can travel through time in a science fiction sense. In reality, Beret Guy is being more literal: after all, as the title-text emphasizes, "there's future everywhere;" everything is "traveling through time" simply by existing, as time is just another dimension. Beret Guy's comments show that he perceives all of life as an adventure, and just as exciting as time travel; his eagerness to "explore" it shows that he takes delight in the unpredictability of life. In this way, the comic criticizes people who become depressed with the lack of control they have over their future: Beret Guy suggests that, rather than continuously worrying, we should enjoy the thrill of the unknown.

Cueball asks Beret Guy why he wishes for a kayak trip, as there is no intrinsic purpose or logic behind this action. However, Beret Guy claims that, in fact, nothing has any intrinsic purpose in the long run, and thus there is no reason not to go on a kayak trip. In this case, if a kayak trip is likely to make you happy, it is the right thing to do. In this way, the comic could be seen as criticizing those who do not take advantage of life's opportunities.

Beret Guy's comments reference existentialism, which is a branch of philosophy that states that there is no intrinsic purpose or meaning to anything in life, as nothing will influence our eventual fate - death. It also states that there is no way of predicting what will happen to us, and that the future is always unknown. The solution is therefore to find one's own purpose in life, and make the most of life's opportunities while they are still available.

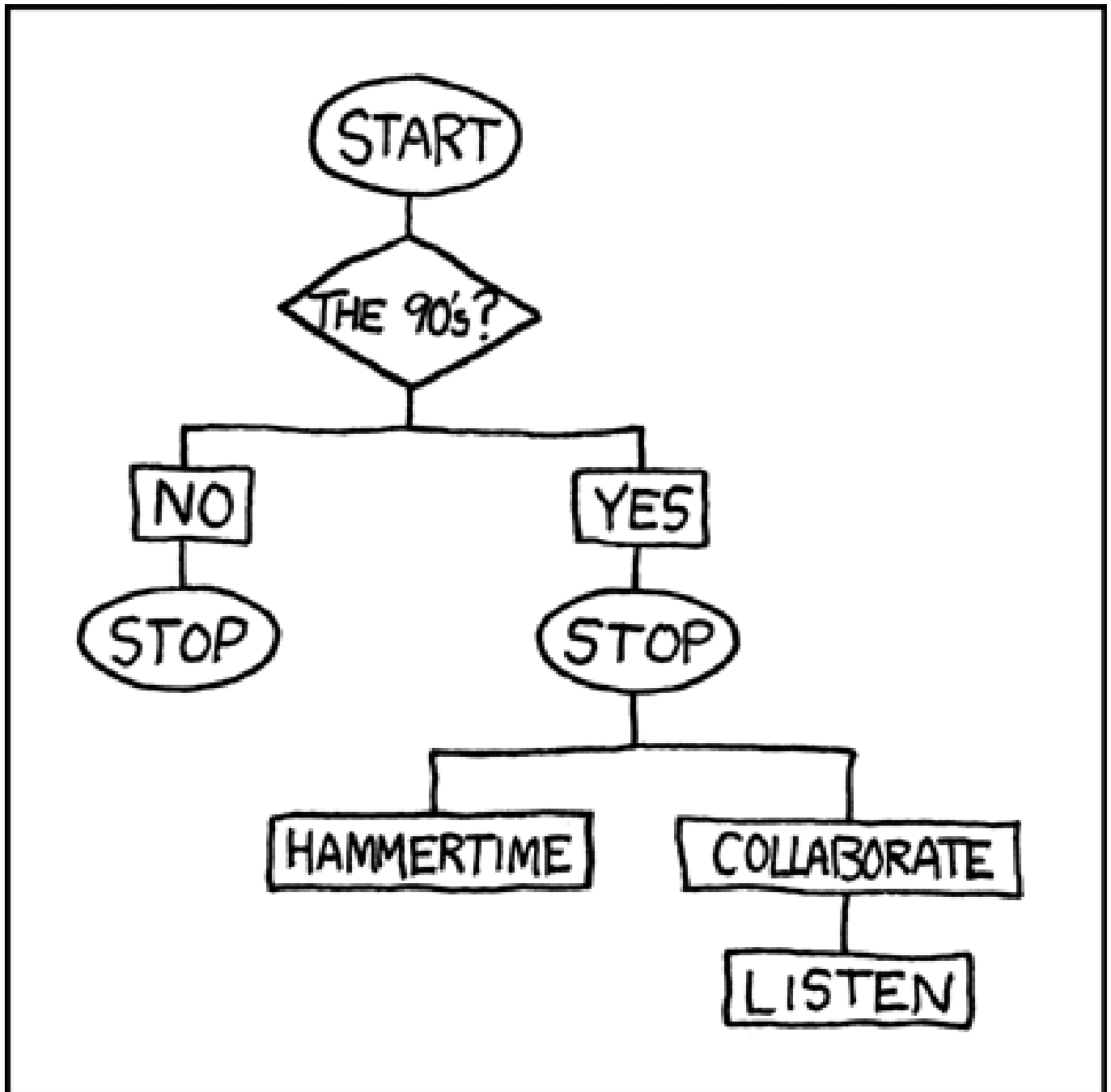
The title text may be a reference to the Calvin and Hobbes collection book "There's treasure everywhere!"

Making the most of life, and rationalizing the familiar, has also been explored in these comics:



- 167: Nihilism
- 187: The Familiar
- The Choices arc.
- 308: Interesting Life

## #210: 90's Flowchart



Freestyle rapping is basically applied Markov chains.

### Explanation:

Here you can see an apparent flowchart. However, it has non-standard notation. The oval normally represents either the start or stop of a process. Here, both the yes and no end up in stop, which would normally imply that nothing below can be reached.

Unless we are in the 90s, this doesn't matter, as there is nothing after the stop. But in the 90s, two processing paths follow, and both are from the lyrics of two-hit rap songs from the 90s:

- U Can't Touch This by MC Hammer, says "Break it down. Stop! Hammertime."

- Ice Ice Baby by Vanilla Ice says "All right, stop. Collaborate and listen."

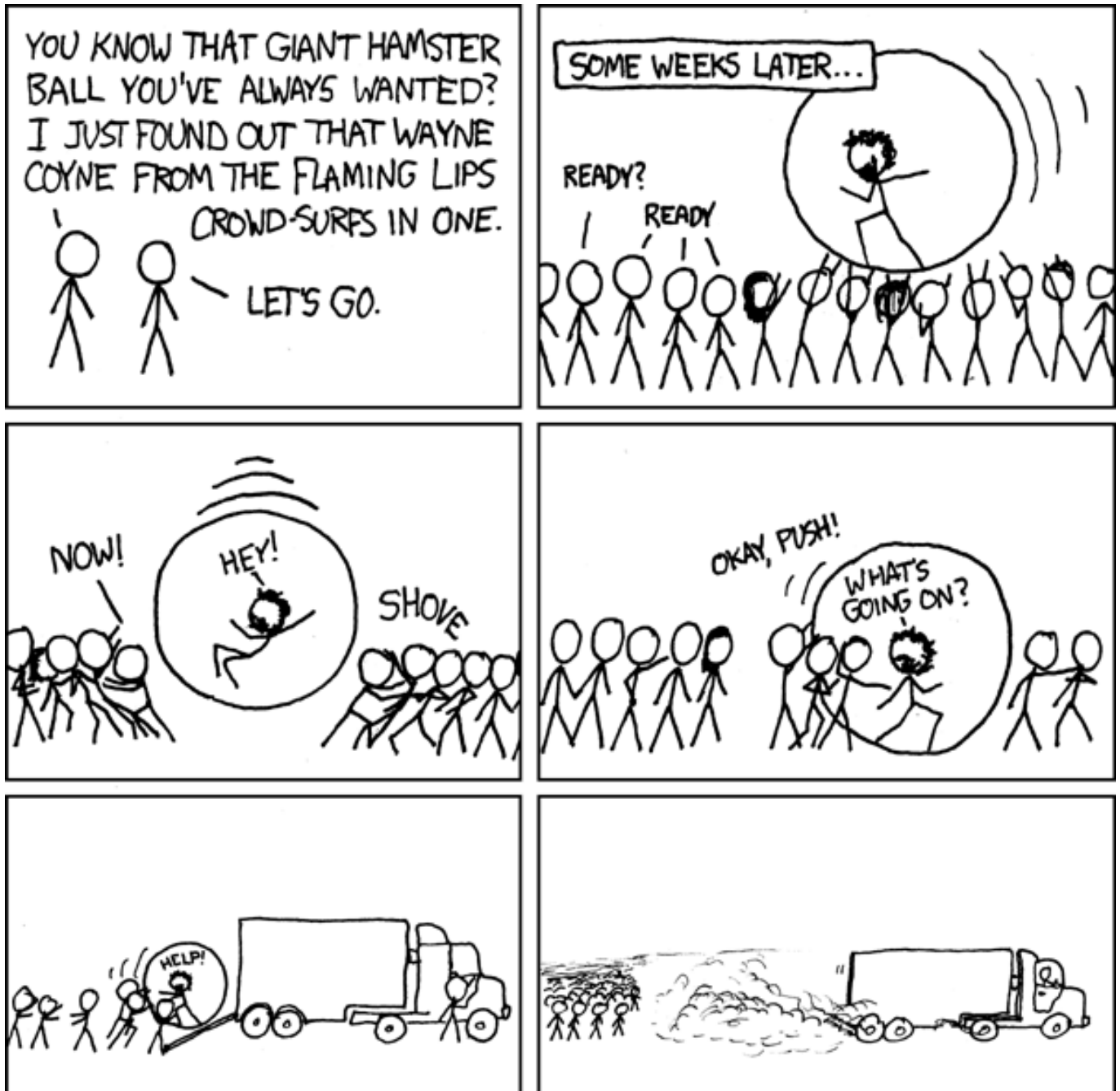
In both instances, the sense of the lyric is that you should interrupt what you are doing, and switch to the new action. Interpreted in terms of flowchart terminology, we could consider that the 'stop' just pauses the main thread, and secondary threads are launched to perform the 'Hammertime' and the 'Collaborate' and 'Listen' activities.

The title text compares freestyle rapping with Markov chains. Markov chains are mathematical constructs in which the state at the next time step is dependent only upon the current state and probability, and not the state at previous times. This is somewhat similar to freestyle rapping, in which what is said next must bear some relationship to what was just said, but the "freestyle" part means that almost anything can be brought in (hence the probabilistic part); furthermore, freestyle rapping allows the rapper to say something next that bears a relationship to what was just said, but not to what was said before that.

There have been several flowchart comics, all of which are listed here.

Both Ice Ice Baby and U Can't Touch This were released in the year 1990, and so their status as "90s" music is disputable. The 1st decade didn't start until year 1 (year 0 does not exist in the Gregorian calendar system), so the 2nd decade didn't start until year 11, and the 3rd decade didn't start until year 21, etc. Whether those songs count as being released in the 90s would be discussed over 2000 comics later.

## #211: Hamster Ball Heist



First person to bring me Wayne Coyne in a hamster ball gets a free t-shirt! He gets one too.

### Explanation:

Wayne Coyne, the lead singer of the band The Flaming Lips, is indeed known to crowd-surf in a giant hamster ball.

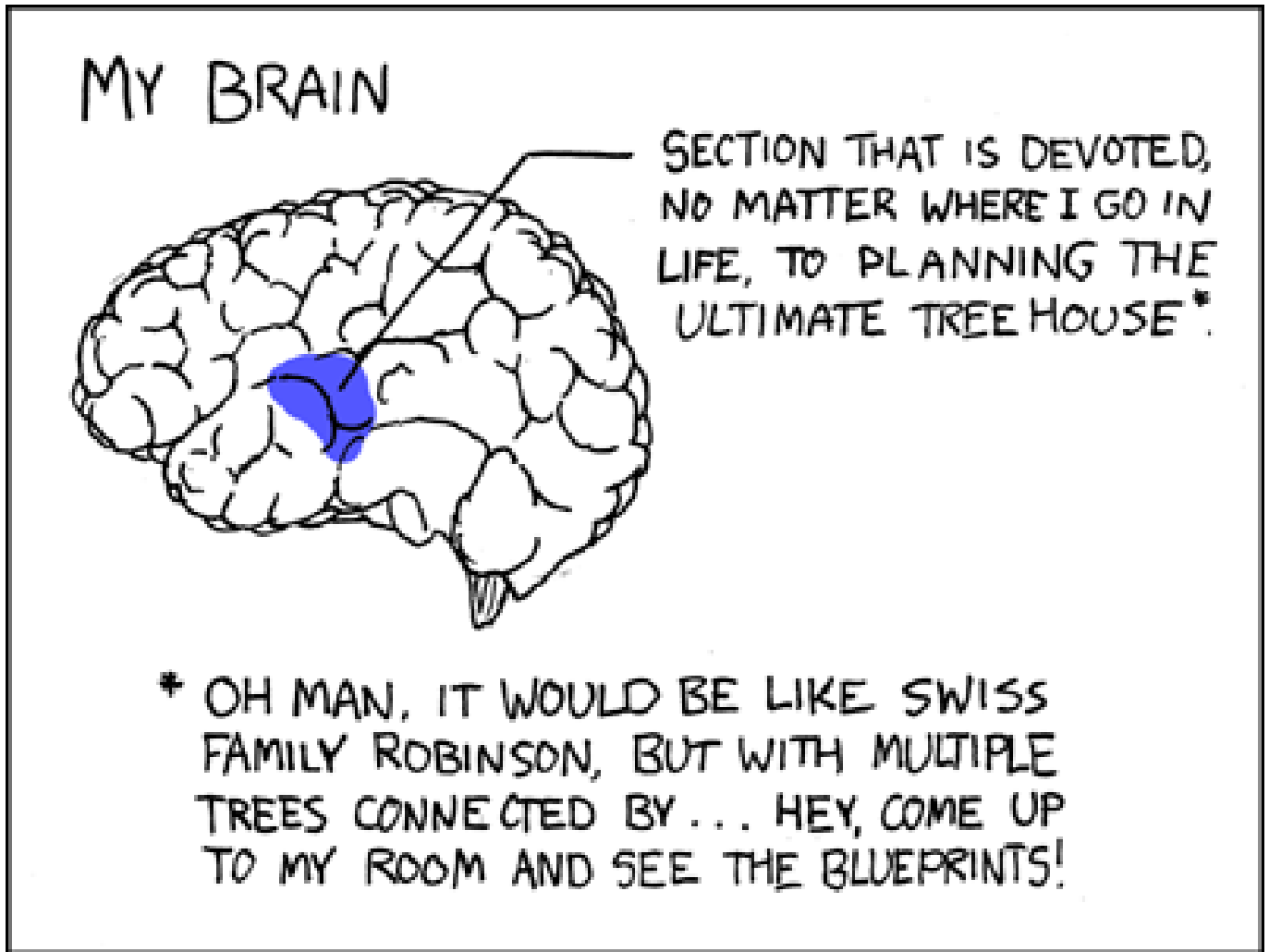
Hamster balls are a recurring subject on xkcd, starting with 152: Hamster Ball, which in direct relation to this comic showed that Cueball's biggest and only wish is such a ball.

When Cueball's friend tells him about Wayne's hamster ball surfing, Cueball says "Let's go," suggesting that they should go and kidnap that hamster ball and Wayne.

The rest of the comic outlines an elaborate mission to acquire a human-sized hamster ball by infiltrating a music concert and stealing the hamster ball while it is in use, thus also kidnapping the rock star, who would be structurally powerless to fight back while trapped within a spherical object. At least four Cueball-like guys help with the mission at the concert, one keeping the crowd back as the other three push the hamster ball into the waiting truck where a fifth friend acts as the driver when they escape with their heist. This has not been attempted, nor should be attempted in real life.[citation needed]

The title text is one of Randall's many open promises, claiming to supply anyone who does this in real life with a free T-shirt, and one for Wayne, too.

It is later revealed in 577: The Race: Part 1, that Cueball paid a large settlement for this heist.



The rest is fear of raptors.

### Explanation:

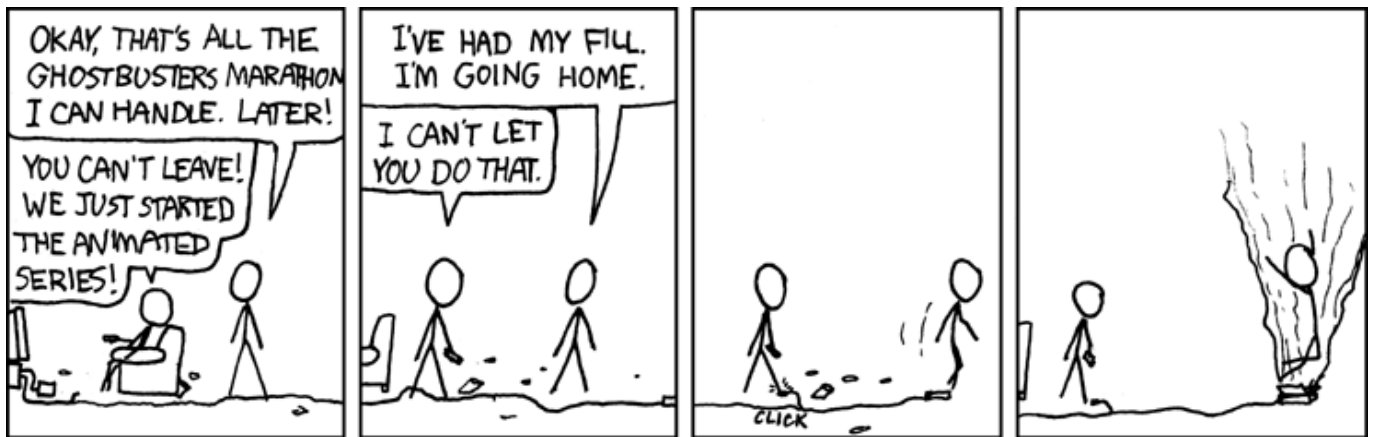
Growing up, many children grow a fascination with tree houses. Tree houses are a child's own special place to do stuff away from their parents, have some autonomy, perhaps form a club. The obsession with tree houses usually fades once a child reaches their teenage years, but of course some of us never grow up. Being an adult geek/scientist who still enjoys childish things, Randall wants to build a sophisticated tree house rather than a simple one.

The Swiss Family Robinson is a novel by the Swiss pastor and writer Johann David Wyss. In the novel, a shipwrecked family builds a tree house as good as a normal house complete with library and mechanical contraptions.

The title text makes reference to the regular xkcd joke about how terrifying Velociraptors from the movie Jurassic Park are. But they could never reach a tree house.

"Raptors" might refer to the informal bird group, hawks and owls and such, a joke relying on the previous infatuation with velociraptors.

## #213: Ghostbusters Marathon



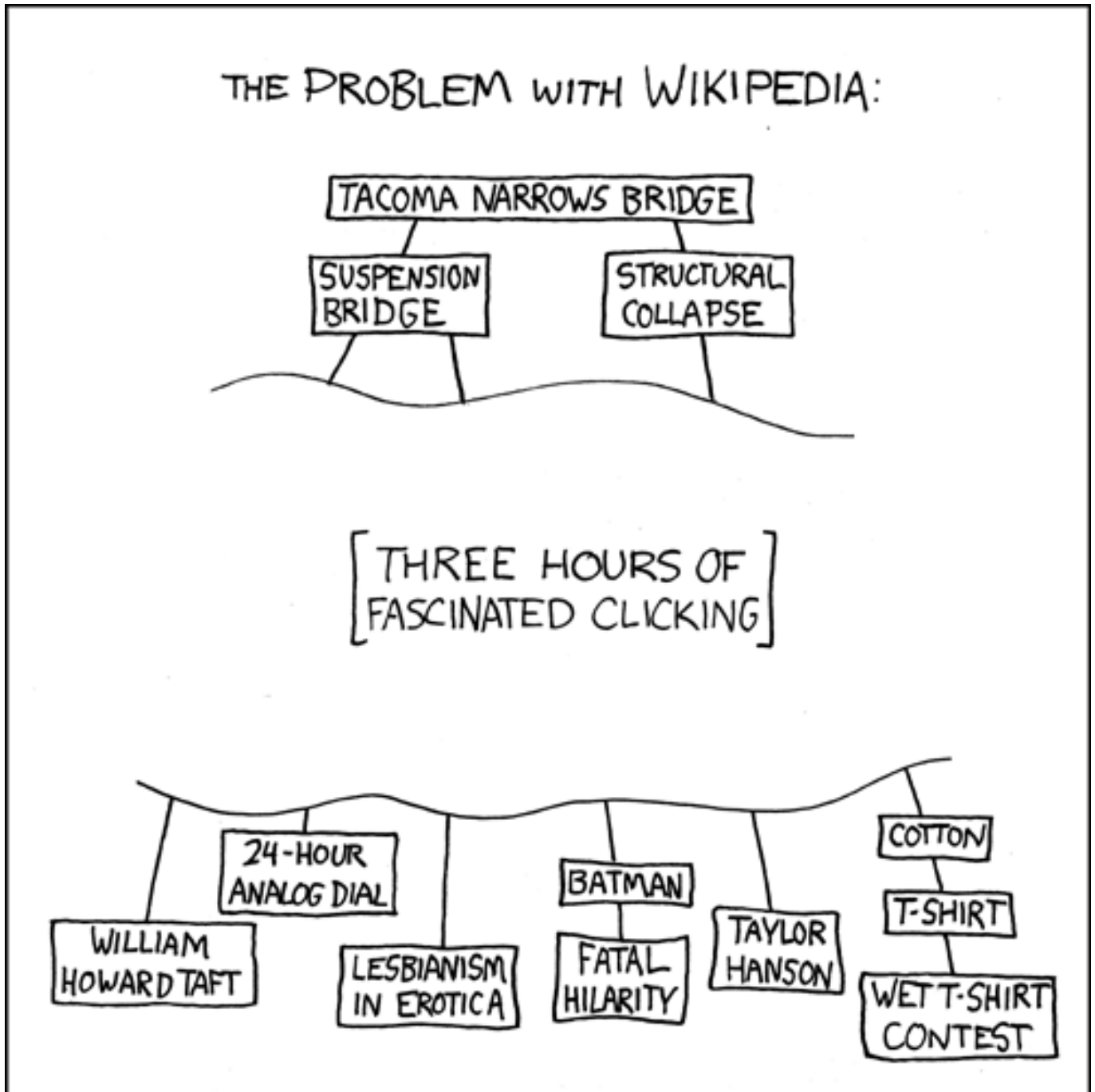
If you walk out that door you'll be crossing the Rubicon with me, and that's one stream I'm not ready to cross.

### Explanation:

Ghostbusters is a 1984 supernatural comedy film that spawned a sequel, two animated television series (the latter of which lasted less than a season, didn't feature the same cast of titular Ghostbusters, and therefore is probably being pointedly ignored...or maybe left as a 'surprise' for later, after getting through the animated series), and, several years after the publication of this comic, a reboot and then another sequel (to the original movies, not the reboot). The box, a "Muon Containment Trap," is a device used in the film to capture ghosts. It is connected to a footswitch by a cable. The man trying to leave is about to be pulled into the box and held there indefinitely (against his will, of course).

The title text refers to Julius Caesar's crossing of the Rubicon, a river (or very large stream) that marked the border between Roman Italy and an area of land Caesar was the appointed governor of. At the end of his term, the Roman Senate ordered him to disband his army and return to Italy. Instead, he brought his forces past the border, an act of treason and rebellion against the Republic, instigating the Roman Civil War. The phrase "crossing the Rubicon" now means making a move with gigantic consequences that cannot be undone. In the film Ghostbusters, the protagonists use "proton packs" that fire "streams" of energy. The inventor of the device warns that these streams should not be crossed against each other, as doing so "would be bad." Just how bad? "Try to imagine all life as you know it stopping instantaneously and every molecule in your body exploding at the speed of light." Important safety tip.[citation needed]

## #214: The Problem with Wikipedia



'Taft in a wet t-shirt contest' is the key image here.

### Explanation:

This comic illustrates the "problems" of information explosion coupled with a dense web of hypertext links. Through most of human history, written media has been both slow and linear. Hypertext allows a new type of information consumption, through small chunks of information linked together in a web of related concepts, and by being digital, each new chunk can be retrieved quickly and effortlessly. Wikipedia applies this principle very strongly, and because it covers so many topics, it is common for a reader to skim an article about a topic they need or want to know about, and end up following a series of links out of curiosity. Since each new page also has several links, the overall navigation pattern resembles a tree that branches out, "exploding" in size with each new



level of link-clicking, thus resulting in many trivia-filled hours (over three in this case) of reading stuff unrelated to the original goal, and lots of open browser tabs holding a wide variety of articles, which are seemingly unrelated, but have common "ancestors." (The problem, for Randall, of wasting time on Wikipedia was later referenced in the title text of 1501: Mysteries, and the more general problem of getting trapped following a never-ending chain of interesting links was covered in 609: Tab Explosion.) The large diversity in end links may also be a reference to the Wikipedia game.

One can also see this effect occur in other MediaWiki-powered wikis such as this very website, where one comic can lead to another of similar relation or category. In the table below, a possible route for each entry has been found.

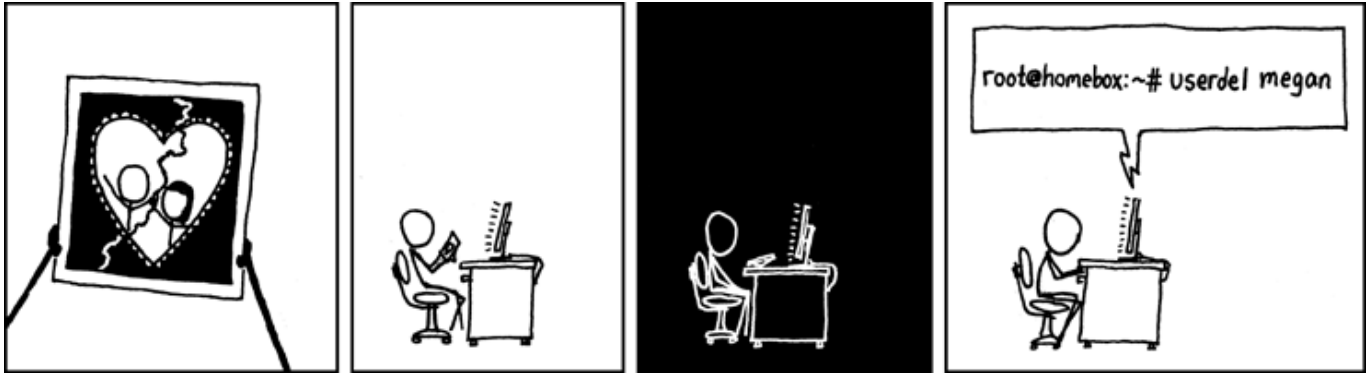
Finding routes between the start and end points of the two pages above and the six below makes good challenges in the Wikipedia game.

The title text refers to two of the articles that were supposedly reached at the bottom. William Howard Taft was the 27th President of the U.S., in office from 1909 to 1913, who was notorious for being so overweight that when a White House chief usher invented a story about him getting stuck in the White House bathtub, people took it seriously. A wet T-shirt contest is an exhibitionistic competition typically featuring young women contestants at a nightclub, bar, or resort. Clearly the combination of these two would be rather bizarre.

There is an online game that involves trying to get from one Wikipedia page to another in the shortest possible route: <http://thewikigame.com/>.

The table below lists one possible option for the most efficient paths to each article, as found on March 14, 2025. Please note that these routes may be outdated or suboptimal in the future.

## #215: Letting Go



At least I never gave her the root password.

### Explanation:

In fiction, a character who has had a romantic relationship end will be shown taking some act to remove a sign of their partner's presence in their life, e.g. removing/selling a wedding or engagement ring, removing the partner's toiletries from the bathroom, or deleting the partner's phone number from a cell phone. This is used to symbolize that the character has accepted the end of the relationship and is ready to move on, no longer pining for their loss or seeking to restore the relationship.

The first three panels imply that Cueball was presumably in a now-terminated relationship with Megan. The final panel shows him using the Unix command 'userdel' to delete her user account from his computer. The joke here is that he considers this to be a significant part of accepting that she is no longer a part of his life, where most people would consider it a routine administrative task.

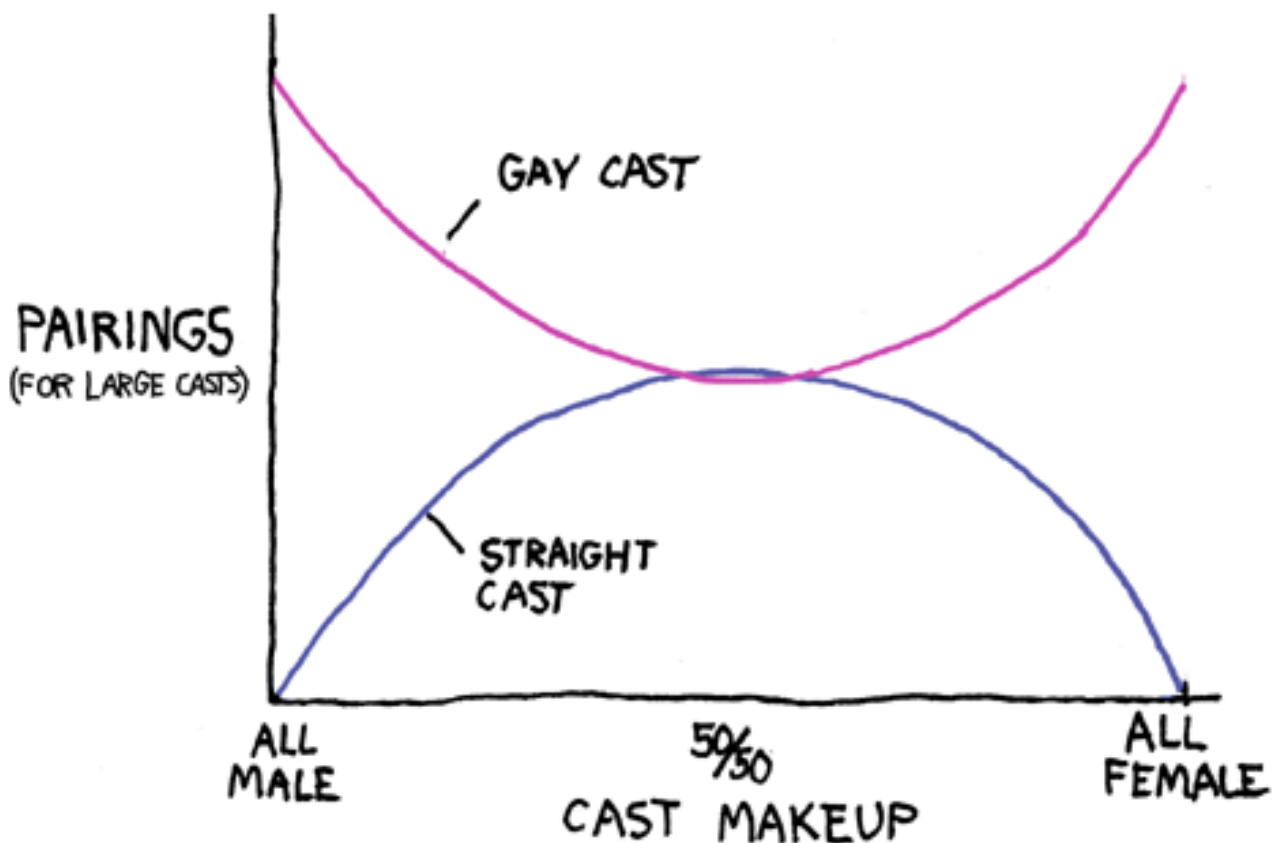
The title text refers to Cueball's thankfulness that he never gave Megan the password to the administrator ('root') account on the computer. It is unclear why this is; he might be worried that she would have used the access to perform malicious actions after the breakup, or simply glad to be spared the need to change the root password. Alternately, it could be a metaphor for marriage and/or a closer emotional relationship, and he is glad that he did not allow her an even greater hold on his heart before the breakup (which would, of course, have entailed commensurately more pain when she did leave him). Not sharing the root password is indicative of a lack of trust in their relationship, which could be a factor in the initial breakdown.

This was only the second time the name Megan was used in xkcd, the first time being in 159: Boombox.

# TV ROMANTIC DRAMA EQUATION (DERIVED DURING A SERIES OF 'QUEER AS FOLK' EPISODES)

	GAY	STRAIGHT
POSSIBLE ROMANTIC PAIRINGS	$\frac{n(n-1)}{2} + x(x-n)$	$x(n-x)$

x: NUMBER OF MALE (OR FEMALE) CAST MEMBERS  
n: TOTAL NUMBER OF CAST MEMBERS



Real-life prospective-pairing curves over things like age can get depressing.

**Explanation:**

In a group of  $n$  people, such as the cast of a TV romantic drama like *Queer as Folk*, the number of possible different pairs of people is  $n(n-1)/2$ . A romantic drama will often consider, over time, many possible romantic pairs of its cast members, even seeming to test the limit of how many pairs are possible. Through an austere binaristic lens, this comic explores the implication of sex and sexual orientation in characterizing the possible pairs.

If everyone in the group is male or female, then each pair could be classified as gay or straight. The formulas in the comic give how many of the possible pairs are gay and how many are straight, as a function of the total number of people and how many are male (or, equivalently, how many are female.) For example, of the 9 principal cast of *Firefly*, 5 are men and 4 are women. With  $n=9$  and  $x=5$ , we have 16 possible gay pairs and 20 possible straight pairs.

A graph shows how the relative number of males and females affects the number of gay pairs and straight pairs. When the group is all male (or all female), all of the possible pairs are gay, but as the minority sex's number is increased, more of the pairs are straight. When the group is half male and half female, the number of straight pairs is maximized, and straight pairs slightly outnumber gay pairs. The curves are labeled "gay cast" and "straight cast", perhaps implying that a "gay cast" would consider only gay pairs, and a "straight cast" would consider only straight pairs.

There is a note that the graph describes large casts. Because all the quantities involved are discrete, for a small  $[n]$  there are only a few points to plot on the graph, and the smooth, continuous curves seen in the comic are less recognizable.

The title-text mentions that Randall made a graph of his prospective dating pool over time and was depressed by the results. As he gets older, his dating pool gets smaller: fewer people his age are single. But as Randall later shows in 314: *Dating Pools*, age is not the problem--he is!

§Formulas[edit]

The formulas may be derived as follows:

Each straight pair needs to include one of the  $x$  males and one of the  $(n-x)$  females, so there are  $x(n-x)$  possible ways of combining one of each. E.g., if there are  $n=5$  people, of whom  $x=2$  are male, then there will be 3 possible pairings involving the first male, and 3 possible pairings involving the second, yielding  $2(5-2)=6$  possible pairs.

Wolfram|Alpha:  $x*(n-x)$

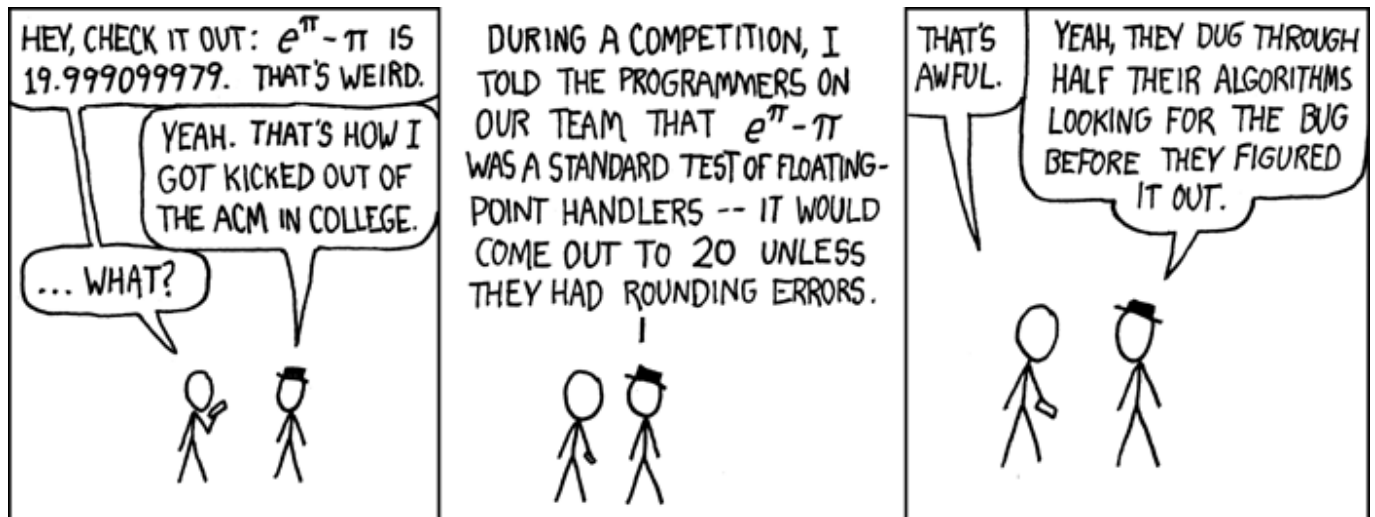
Each gay pair needs to include either two males or two females. To choose two males, we can start with any of the  $x$  males and choose any of the  $(x-1)$  remaining males. However, that counts each possible pair twice. E.g., Adam&Steve got counted when we chose Adam first and Steve second, and again when we chose Steve first and Adam second. To avoid double-counting the pairs, we therefore need to divide the product by 2. So there are  $x(x-1)/2$  possible pairs of two males. Similarly, there are  $(n-x)(n-x-1)/2$  possible pairings of two females. Summing these, we get the total number of possible gay pairs as  $[x^2 - x + n^2 - nx - n - xn + x^2 + x]/2$ . That simplifies to  $[n^2 - n + 2x^2 - 2xn]/2$ . The left two terms can be combined together as  $n(n-1)$  and the right two terms

can be combined together as  $-2x(n-x)$  or  $2x(x-n)$  [which is negative, because  $x-n < 0$ ]. Since the sum of these terms was divided by 2, we get that the total number of possible gay pairs is  $n(n-1)/2 - x(n-x)$ , or  $n(n-1)/2 + x(x-n)$ , which is what the cartoon says.

Wolfram|Alpha:  $n*(n-1)/2+x*(x-n)$

Desmos: <https://www.desmos.com/3d/j0sgfhhbcci>

## #217: e to the pi Minus pi



Also, I hear the 4th root of  $(9^2 + 19^2/22)$  is pi.

### Explanation:

$e$  is a mathematical constant roughly equal to 2.71828182846.  $\pi$  is another, roughly equal to 3.14159265359.

The first panel discusses  $e\pi - \pi$ , which is around 19.999099979 — very close to 20. Black Hat explains how he tricked a programming team into believing that  $e\pi - \pi$  really equals 20 — instead of just being weirdly close — thus that any noticeable deviation from 20 results from errors in the code. This made them waste a lot of time trying to find a nonexistent bug until they realized that Black Hat was lying (clearly they had not known him for very long, and clearly they weren't very knowledgeable in mathematics).

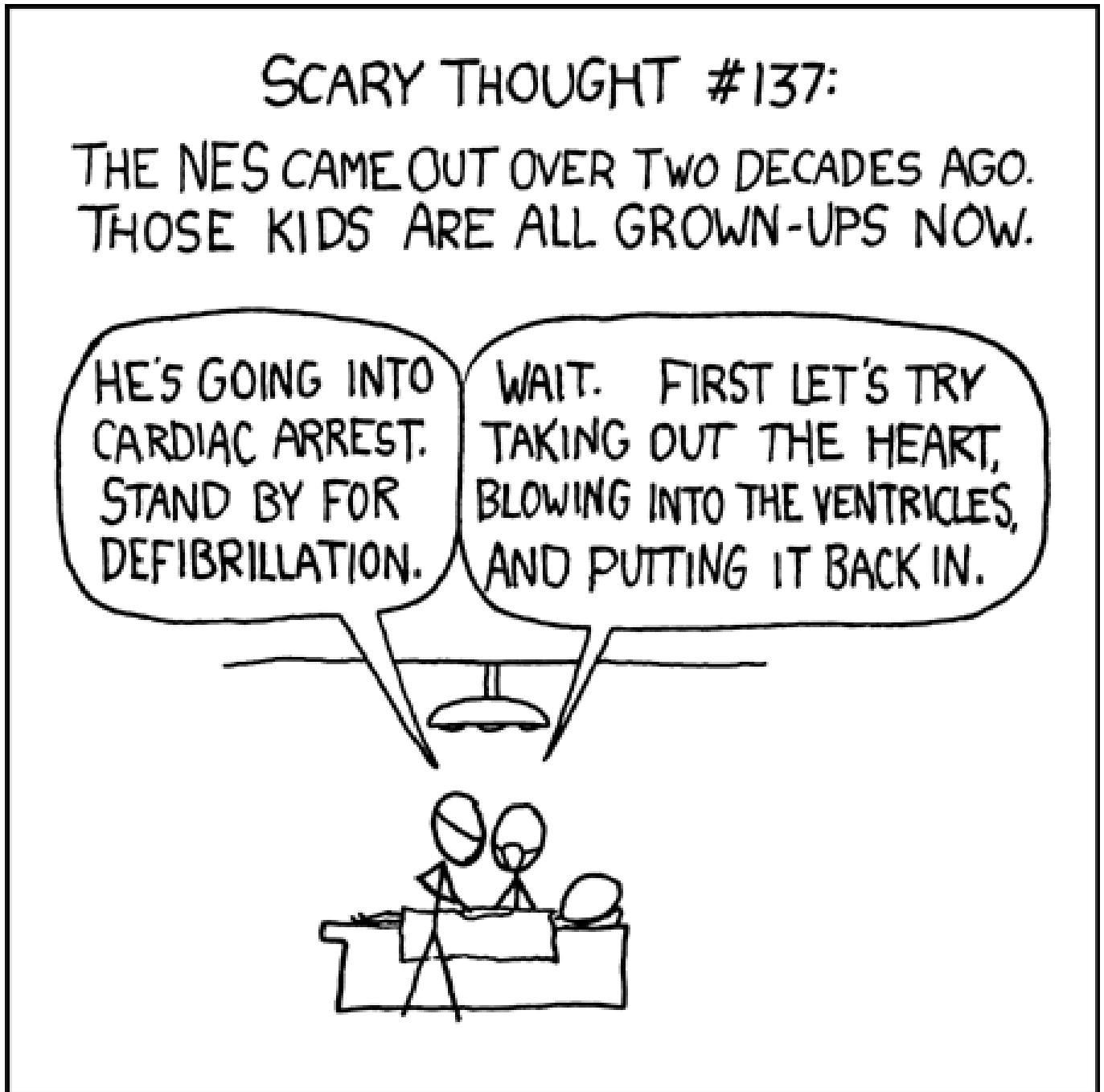
Floating point numbers are how computers store non-integer real numbers as decimals — or rather, in most cases, approximate them: infinite amounts of data would be required to represent most numbers in decimal form (exceptions are integers and terminating decimals). The "floating-point handlers" would be the code performing the  $e\pi - \pi$  calculation.

ACM is the Association for Computing Machinery, which at the time of writing sponsored the International Collegiate Programming Contest. It is likely that it was this competition, in which Black Hat wasted his team's time, for which he got kicked out.

The title text pokes fun at another coincidence:  $(9^2 + 19^2/22) \approx 3.1415926525$ , equating close to  $\pi$  (deviating only from the 9th decimal place). The humor comes from the fact that  $\pi$  is transcendental. Transcendental numbers are numbers that cannot be expressed through basic arithmetic with integers; one cannot end up with the exact value for any transcendental number (including  $\pi$ ) by adding, subtracting, multiplying, dividing, exponentiating, and/or taking the  $n$ th root of any rational number, meaning the title text cannot possibly be true. This coincidence was discovered by Ramanujan while squaring the circle in 1914.

A much later comic, 1047: Approximations, puts forth quite a few more mathematical coincidences, and 3023: The Maritime Approximation does similarly for measurement

units.



Scary thought #138: Raptors coming down the waterslide behind me.

### Explanation:

The Nintendo Entertainment System, released in North America in 1985, helped revitalize the video-game industry after the video-game crash of 1983, with such games as the Super Mario Bros. series, The Legend of Zelda, the Mega Man series, Castlevania, and Metroid helping it stand alone as what is still considered by many people today, the greatest video-game console of all time.

However, it was notorious for glitching games upon start-up, due in no small part to the unusual shape of the game console, which required one to open the door, push the game cartridge inside, push down to lock it in place, and push the power button. The console



was deliberately designed this way so that it wouldn't look like a regular video-game console (and wouldn't be associated with the still-fresh stigma of the video-game crash only two years previous), but it caused no end of pain for people wanting to play the games. It would work fine for about two years, but after that "cartridge tilt" would become a problem as either the game's or the console's electric contacts could become misaligned.

A ubiquitous fix for this problem among gamers was to take the cartridge out, blow into it, and put it back inside, all to clean out any dust inside the cartridge that would make "cartridge tilt" worse and occur more frequently. This was not a recommended solution by Nintendo of America, and didn't always work, but it worked frequently enough to enter gamer culture, and even today, people who had the NES as children remember having to do that. Some posit the act of cartridge reinsertion alone contributes most of the curative effect with the blowing only giving comfort/satisfaction value to the user if not introducing potentially harmful moisture as well.

The NES was 22 years old as of the date this comic was written. Someone who was 10 years old when they got their Nintendo for Christmas could very well be old enough in 2007 to have attained their doctorate degree, and so this comic hearkens back to the aforementioned cartridge fix by suggesting that a heart surgeon might try that on a real-life heart patient. And like the introduction states, that is a scary thought.[citation needed]

The title text is one of many xkcd references to the terrifying Velociraptor predator from the dinosaur movie Jurassic Park.

## #219: Blanket Fort



Also, we have a fort out in the woods where we stashed that hooker's body.

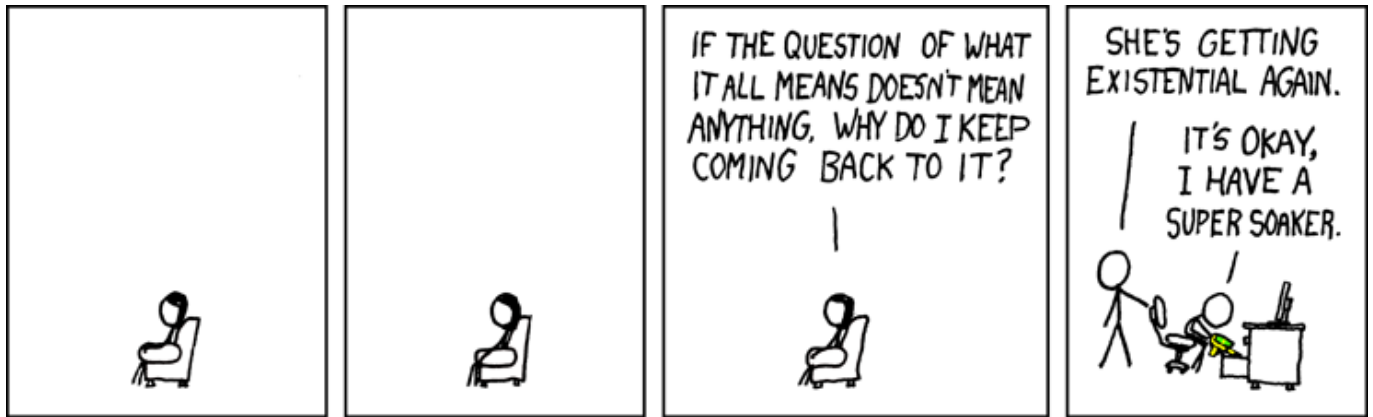
### Explanation:

In an apparent continuation of comic 150: Grownups, Megan is showing off a blanket fort to her friend Ponytail. Ponytail answers that Megan's childishness stems from a fear of growing up.

Megan responds that she's fine with growing up. She sees her behavior as a mature realization that some of the things she enjoyed as a child are still enjoyable. When pressed for evidence that she has in any way become an "adult," it is revealed that her boyfriend, presumably Cueball, is inside the blanket fort. He has not spoken because he fears to be found by them when "not exactly dressed," thus implying that "adult" activities had been going on in the fort.

The title text provides another example of this: They built a fort in the woods, another type of fort that a kid would love to have, but then used it to hide a body. This implies that they killed someone, which is not usually something associated with children.[citation needed] A hooker is also more formally known as a prostitute, which is also not usually something associated with children.[citation needed]

## #220: Philosophy



It's like the squirt bottle we use with the cat.

### Explanation:

In all of philosophy, perhaps the most important questions consider the meaning of life and can be expressed as "Why are we here?" or "What does it all mean?" Many philosophers and theologians have attempted to answer the question over the course of human history, and every religion claims to have some sort of answer.

Megan has been considering that the question is essentially meaningless. However, if that is true, she can't understand why it continues to be in her thoughts. This might feel frustrating for Megan. Two of her friends (both Cueball-like) notice that she is seemingly stuck in this existential question and have a short-term solution for her. One friend reaches for a Super Soaker 50, a powerful toy squirt gun, to shoot at Megan while she is having an existential crisis. (Megan uses this soaker later against Cueball in 517: Marshmallow Gun and 2334: Slide Trombone, and in comic 625: Collections, she has another one of her crises.)

The title text refers to the operant conditioning technique (a form of behavioral modification) commonly used with house cats. If they start scratching the furniture, many people spray them with a squirt bottle (since they hate water) to discourage that behavior (though it seldom works). It may also allude to the idea of hitting a break key where a program is stuck in a logical loop.

Megan has since this comic had existential crises both in 1111: Premiere and in 1822: Existential Bug Reports.

## #221: Random Number

```
int getRandomNumber()  
{  
    return 4; // chosen by fair dice roll.  
              // guaranteed to be random.  
}
```

RFC 1149.5 specifies 4 as the standard IEEE-vetted random number.

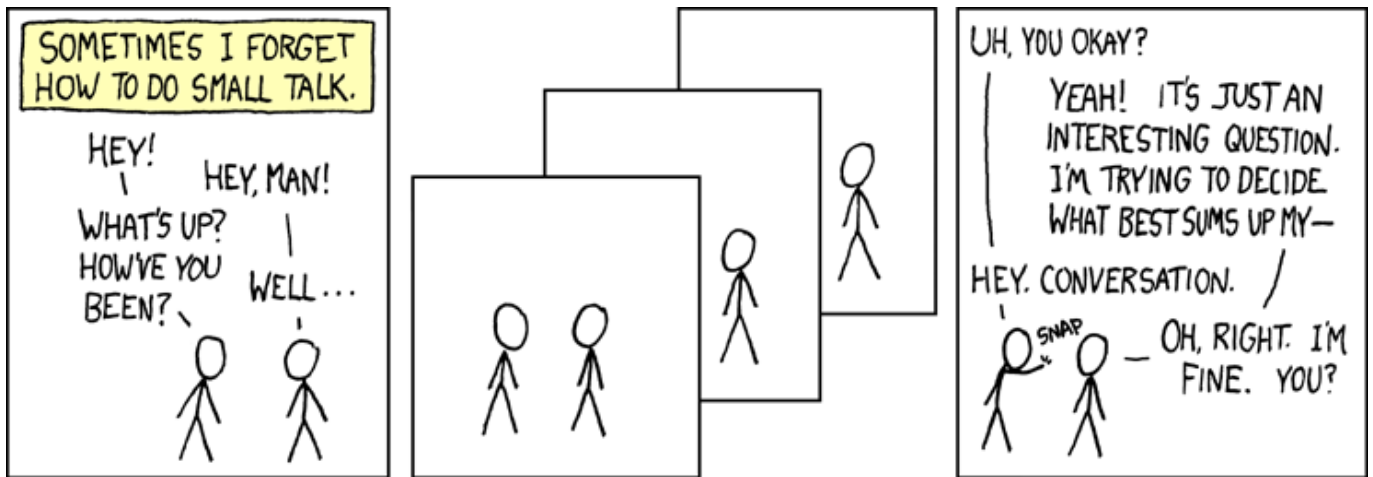
### Explanation:

The comic specifies a function (in a C similar syntax), which judging by its name should be designed to return a random number. Most functions of this form are random number generators, meaning that on subsequent calls they return different random numbers. But the programmer has instead implemented a function that just returns the same random number each time, which, while it could indeed have been truly randomly chosen by rolling a die as the comment documented, is essentially worthless were it ever to be called more than once (with the expectation of different, i.e., random, results). In other words, the results over time would not be random at all, but completely predictable and deterministic.

Alternatively, this could be seen as making fun of how people normally will erroneously think of "random numbers". A mathematician will (or at least should) think about a random number as one that is independent of something (usually being independent of the next number in a list of numbers). However a normal person will often think of a list of random numbers as just meaning it having "no pattern". This difference is described in an MIT koan. (Just to drive this point home, if the first number of a list is "4", and the second number is independent of the first, then that means the second number can also be "4" (as well as the 3rd and 4th). This obviously creates a "pattern", while still being random because of the independence)

The IEEE is the organization responsible for maintaining a number of computer standards. An RFC, or Request for Comments, is a formal document put out to computing experts by IETF in the hopes of becoming a future standard. However, RFC 1149 was an April Fools' joke, IP over Avian Carriers, defining how carrier pigeons can be used to transmit Internet packets. "RFC 1149.5," meanwhile, simply does not exist.

## #222: Small Talk



But surely I owe you an accurate answer!

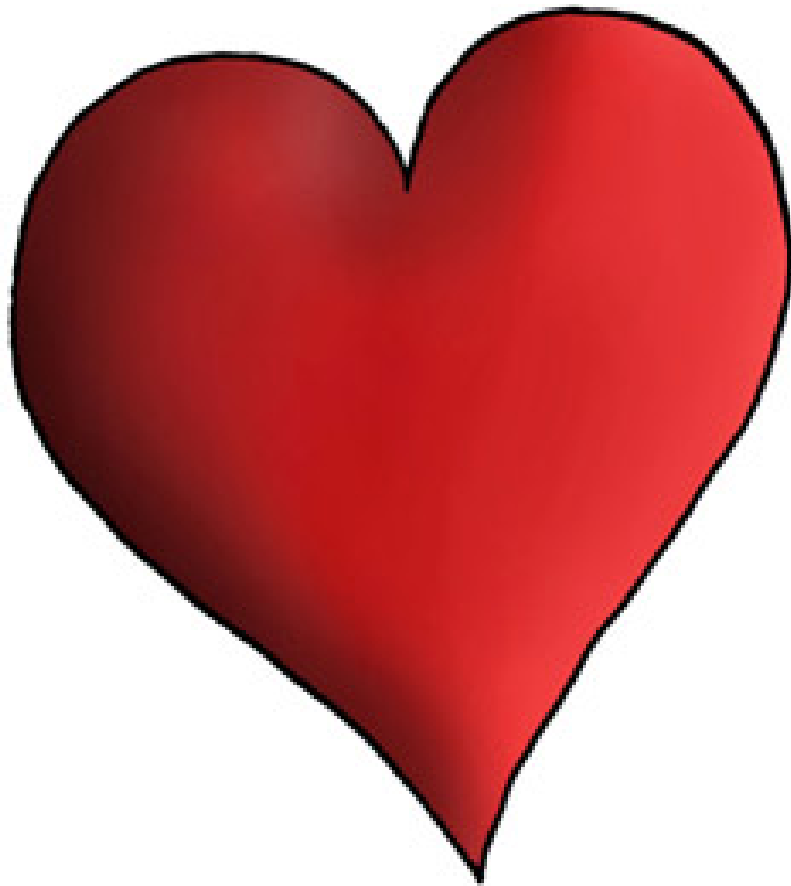
### Explanation:

Cueball is approached by his friend who offers one of the standard greetings of, "What's Up? How've you been?" In standard "small talk," an appropriate answer would be only one or two words (e.g. "Fine" or "Pretty good"). These are generally positive responses, with negative ones only offered in extreme circumstances. In this situation, Cueball forgets that this type of answer is what his friend is expecting. Instead, he contemplates thoroughly on his condition, wanting to provide accurate, detailed information to his friend. His response sheds light on the many layers of meaning a simple question such as "What's up?" can have. His friend, thrown off by the delayed response, snaps his fingers to regain Cueball's attention and reminds him that they are having a conversation, which is best facilitated by the standard short responses.

The title text shows that Cueball was more interested in accuracy than the ease of the conversation, simply out of respect for his friend.

This was one of the earliest examples of problems with social interactions for Cueball (or Randall). Since this comic it has been a recurring theme on xkcd. It is especially similar to the much later 1961: Interaction.

VALENTINE'S DAY



BECAUSE LOVE ISN'T QUITE  
COMPLICATED ENOUGH AS IT IS.

One of these days me and Joey Comeau will get around to subverting the hetero-normative paradigm and fixing all this.

**Explanation:**

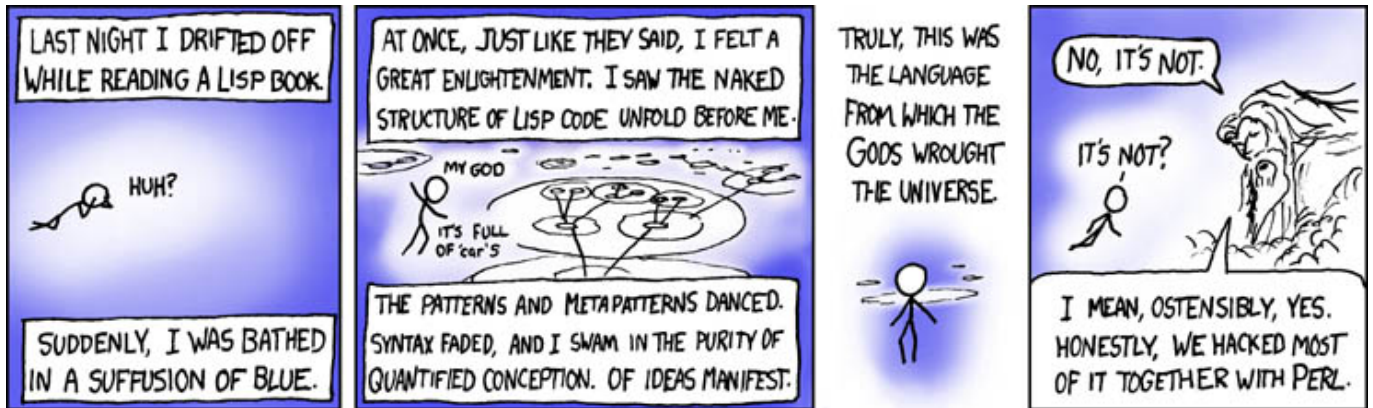
As mentioned in the comic, love is already pretty complicated, even more so on Valentine's Day. Valentine's Day makes it more complicated by introducing all kinds of questions. Is our relationship such that it should be acknowledged on Valentine's Day?

If so, how? If by a card, what kind of card would be best? If by something more than a card, what? Candy? Flowers? A Date? What does the Valentine I received really mean? Friendship? Love? A covert request for sex? (see 63: Valentine - Heart). As an example of the kinds of dilemmas that can arise, see also 1016: Valentine Dilemma.

The phrase "Because love isn't quite complicated enough as it is" is an obvious use of sarcasm, as love is really complicated, according to Randall (see above).

Referenced in the title text, Joey Comeau is the author of the webcomic A Softer World. It is a queer comic whose work also discusses love in various forms, so between them, Randall Munroe and he are a good team to consider working on "subverting the hetero-normative paradigm." Heteronormativity is the body of lifestyle norms holding that people fall into two distinct genders with natural and complementary roles in life. Whether or not anything that cartoons can do would fix the Valentine's Day problem is another issue. Among other things, ditching the hetero-normative paradigm presumably complicates things in terms of potential love relationships, which now include more possibilities than male-female, as is shown in 216: Romantic Drama Equation. All of these might face the Valentine's Day issues in various ways.

## #224: Lisp



We lost the documentation on quantum mechanics. You'll have to decode the regexes yourself.

### Explanation:

Lisp is a computer programming language with simple, highly regular syntax. The language's most notable feature is that programs take the same form as the language's primary data structure (the linked list). This blurs the line between code and data and permits programs to inspect and even alter their own source code, thereby opening up deep opportunities for metaprogramming. Lisp is also a functional programming language (though not purely functional, as some more recent languages are), meaning that programs are expressed in terms that are simple elaborations or extensions of the lambda calculus, a formal mathematical model of computation. This gives programs written in functional languages such as Lisp a distinctively abstract, mathematical form that is commonly considered difficult to fully grok (see 1270: Functional).

The phrase A suffusion of blue is a reference to Douglas Adams' book *The Long Dark Tea-Time of the Soul*. In it, an I Ching calculator calculates that everything above the value of 4 is a suffusion of yellow.

In the comic, Cueball marvels at the fundamental and complete nature of the language of creation that he sees in his dream. In the Lisp programming language, "car" is a primitive (i.e. basic) function that produces the first item in a list. The line "My God, It's full of 'car's" is a pun, most likely referring to the movie *2010: The Year We Make Contact*, the sequel to *2001: A Space Odyssey*. In the book *2001: A Space Odyssey*, when astronaut David Bowman accidentally activates a star gate, he exclaims as he enters it "The thing's hollow — it goes on forever — and — oh my God - it's full of stars!", although he does not say anything in the first movie during the final sequence. This likely also includes a transitive reference a chapter in *The Little Schemer*, a popular introductory Lisp book, called *\*Oh My Gawd\*: It's Full of Stars*, also itself a reference to *2001*. From the shape of the two discs in front of Cueball, it may also be referring to Terry Pratchett's book *The Last Hero* where the last survivor of a ship that went under the disc says "Oh my God it's full of elephants."

In the second panel, Cueball remarks that, "At once, just like they said, I felt a great enlightenment." This is a reference to a pattern of observations among programmers and computer scientists that while Lisp often seems alien or arcane — even deliberately so, even to experienced hackers, even with repeated exposure over time — truly



understanding Lisp in a deep, non-superficial way, results in a profound epiphany, a sudden and abiding illumination wherein one's preconceived notions about computation and programming are fundamentally transfigured, oftentimes over the course of a very short span such as during a single all-day hacking binge. Lispers commonly describe the experience as being akin to learning programming for the first time again; Daniel P. Friedman (author of much ground-breaking research and many popular introductory texts on Lisp and programming language design) described it as "[learning] to think recursively," and contended that "thinking about [functional] computing is one of the most exciting things the human mind can do."

Cueball's remarks about patterns, metapatterns, and the disappearance of syntax are reactions to the elegant simplicity of the Lisp programming language, in which it is relatively easy to build immensely sophisticated programs using simple recursive elaborations of structure. This is fundamentally unlike the much more typical and common imperative programming languages, in which programs are written as chains of instructions for the machine to follow.

Cueball then, in the third, borderless panel, muses that this has to have been the language the gods used to create the universe, which is a pretty bold statement that Cueball seems to make because he views Lisp as something flawless and perfect, as these are qualities that often subjectively apply to things that people, like Cueball, claim to have been made or used by gods or other holy beings.

A cloudy, bearded man, presumably representing God, states that this is untrue, and after a surprised inquiry from Cueball replies that the universe was actually hacked together with the programming language Perl. Perl employs an idiosyncratic syntax that borrows liberally from a number of other languages. Although a versatile language often employed for assembling projects quickly (the much-loved Programming Perl introduces it as "[the] language for getting your job done"), Perl has a reputation for being ugly and inelegant, partly as a result of its pidgin-like fusion of many inconsistent language elements and code styles. It was famously described as a "Swiss-Army chainsaw," because it is very powerful but also unwieldy and unattractive. By way of contrast to Daniel Friedman above, Larry Wall, the creator of Perl, criticized the highly cerebral Lisp attitude toward programming with the words

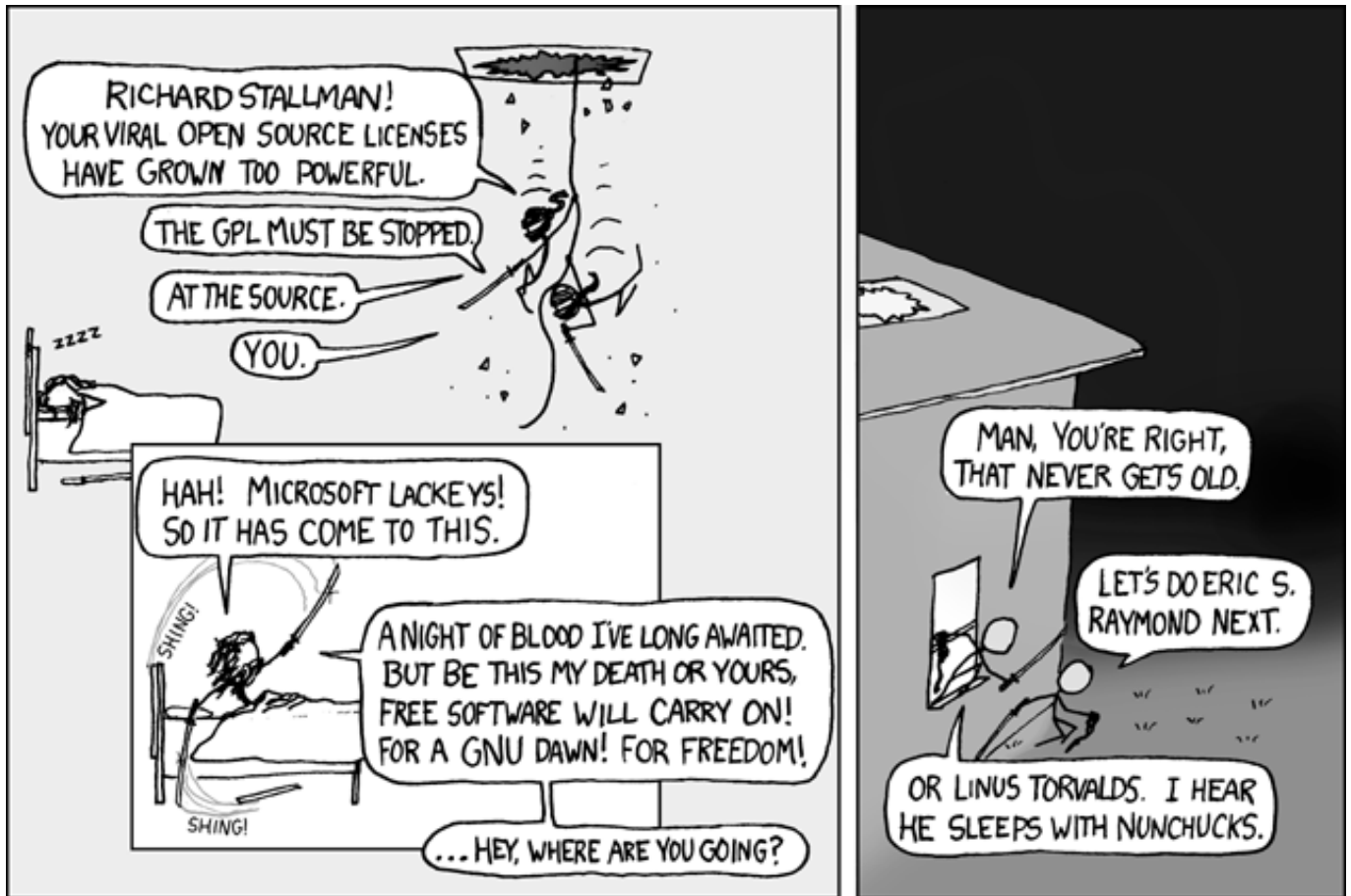
The joke is that the Creator, like many software developers, was a bit rushed and chose to quickly throw together a working prototype rather than do the job right from the beginning; concurrently, that Cueball, thinking he has discovered an amazing and beautiful secret in the hidden world of Lisp, learns that in fact the real world is filled with ugly hacks and quick-and-dirty imperative code.

A (possible) hidden joke might be an oblique reference to Greenspun's tenth rule when God replies with "I mean, ostensibly, yes." Greenspun's tenth rule says that any sufficiently complex program written in another high level programming language will necessarily contain an imperfect, undocumented, slow, and bug-ridden implementation of about half of Common Lisp. Greenspun's tenth rule was meant to express the belief that Common Lisp, a large, full-featured Lisp dialect, is so flexible and robust that any attempt to render any really sophisticated program in most other languages requires the programmer to expend extraordinary effort unwittingly reinventing, in needlessly convoluted fashion, features and systems that would be elegant and trivial in Common Lisp. This explains why such a program might look or feel "Lispy" to an unfamiliar observer, and why the universe (if viewed as such a program) might look to mathematicians and scientists as though it probably has a beautifully simple

mathematical basis, even if in reality it was just hacked together with a bunch of ersatz, special-case rules.

The title text continues the analogy by suggesting that the theory of quantum mechanics was written in regular expressions ("regexes"), a complex language for pattern matching used heavily in Perl. Regular expressions are often criticized as being a write-only language, that is, a language so complicated in syntax that any significant program written in them cannot be understood by anybody (often not even the original author). Documentation is essential to assist in the understanding of complex regular expressions. The title text claims that at some point, the documentation for quantum mechanics was lost, which explains why quantum mechanics is so bizarre and counterintuitive.

## #225: Open Source



Later we'll dress up like Big Oil thugs and jump Ralph Nader.

### Explanation:

Richard Stallman, or rms, after his handle, is an old-school hacker known for establishing the Free Software Foundation (FSF) and initiating the GNU Project in the early 1980s, which produced major portions of what would later be the Linux (or GNU/Linux) operating system. In this capacity, he's also known for being one of the most ardent and outspoken proponents of open source software, often referred to by Stallman as free software. In fact, his advocacy is so emphatic and polemical that he has garnered active dislike from traditionalists who believe that software source code should be retained as a trade secret by its developer(s). Stallman has expressed that he did not even wish to be in a comic using the phrase Open Source (see the trivia section).

While this dislike may not rise to the level of hiring ninja assassins to remove him from the world though that is historically inaccurate, it is strong. The joke of the comic, as it also turns out, is that the two Cueballs dressed up as ninjas were just out to have a fun time teasing Stallman, and they seemed to know that Stallman's paranoia about Microsoft makes him sleep with no fewer than two katana swords near his bed. This type of sword was one of the traditionally made Japanese swords that were used by the samurai of feudal Japan mainly as a sidearm. A ninja or more accurately a Shinobi no mono was basically special forces in feudal Japan. They specialized in espionage, sabotage, etc. they were a rough combination of MI6, CIA, and Navy SEAL in feudal Japan. Although they did not specialize in assassinations, that is something that they could do. Although samurai could also be shinobi/ninjas if they chose to do that job,

samurai is a social class while shinobi no mono/ninjas were a job, not a social class. So this makes sense in this comic with Stallman, the samurai, and the ninjas, the lackeys of the oppressing Microsoft (at least in his mind). It also turns out that they specifically choose targets for their raids who have reason to be paranoid of larger companies that might send someone after them, and thus sleep with weapons near their beds. Stallman has received a Katana due to this comic (see the trivia section).

GPL refers to the 'GNU General Public License', which is a copyright license written by the FSF that covers much GNU software and plenty of other free software besides. It stipulates that software so copyrighted must always be provided along with full source code, and that everyone in possession of such software is free to use, study, modify, and redistribute it for any purpose whatsoever (including sale or resale), provided they give due credit to any other contributing developers and provide access to the complete source code and retain all copyright notices.

Legally, this gives all users of such software exactly the same rights under copyright as the developer(s) and prevents any developers from ever taking away those rights from users, which is the defining feature of 'free-as-in-libre' software. It also has the effect of making all software derived from GPL software thereby also GPL, even if 'derived' merely means 'borrowed a few lines of code from'. Some (e.g. Microsoft's Steve Ballmer) have therefore argued that this makes GPL software behave as a kind of 'license virus', which spreads GPL-guaranteed freedoms to any software used in close conjunction with GPL'd software during development, such that businesses should actively avoid adopting free and open source software, so as not to jeopardize software developers' legal standing with regard to proprietary IP copyrights.

During the attack, Richard Stallman begins to speak like he quotes an old play. For instance, the wording "For a GNU dawn!" is pronounced "For a g'new dawn!", following the pronunciation of GNU, so it is a version of New Dawn, a sentence used often in fiction. He even gets annoyed when it turns out that the ninjas just run away. He had clearly waited a long time to, even looking forward to, defending himself with his katanas.

Because the two "ninjas" had so much fun pranking Stallman, they plan to do more of these raids, even mentioning two other possible future targets on their way out of the window:

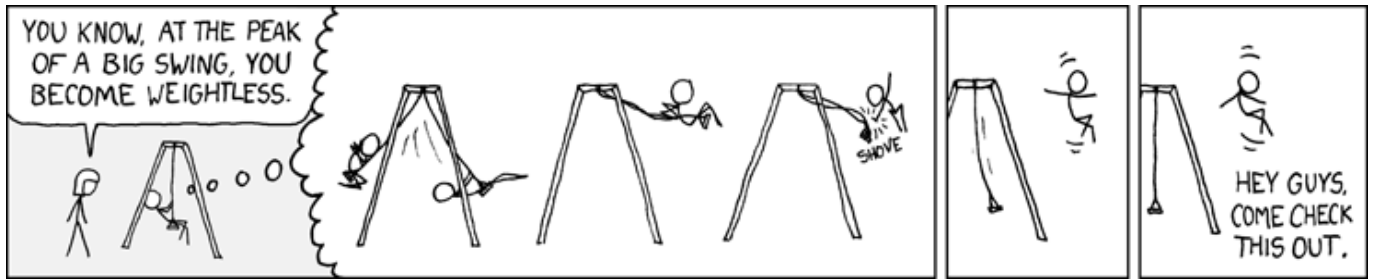
Eric S. Raymond is a famous hacker who wrote *The Cathedral and the Bazaar* and has been something of an unofficial spokesperson for open source as a software development methodology. The plan to prank Eric Raymond could be a bad one, since he is an experienced martial artist, swordsman, and firearm enthusiast. However, this seems to be the attraction of these two "ninjas," as can be seen by what they seem to know about their other possible target:

Linus Torvalds is the creator of Linux, a free/open source operating system kernel inspired by the Unix kernel, which proved to be the final component that, combined with then pre-existing GNU system functions and userland components, produced the first fully free operating system, GNU/Linux. The plan to prank Torvalds would at first sound more boring as the mild-mannered Finn, while known to be strongly, abrasively opinionated, is otherwise mostly harmless. However, one of the ninjas seems to know otherwise, since it is rumored that Linus sleeps with nunchucks in the same way that Stallman sleeps with two katana swords. The nunchaku is a traditional Okinawan martial arts weapon consisting of two sticks connected at one end by a short chain or

rope.

A third possible target of this prank is mentioned in the title text. Ralph Nader is a famous consumer rights advocate, most famous for his controversial 2000 presidential run, and the 1965 book *Unsafe at Any Speed*. Nader is an environmentalist and a member of the Green Party, and he supports clean energy, thus naturally being opposed to "Big Oil" companies.

## #226: Swingset



Someone bring me a pocket fan so I can drift around the yard.

### Explanation:

In the opening panel of this comic, Blondie, probably as Miss Lenhart, sees Cueball sitting on a swing set. She tells him that at the apex of his swing, he'll become weightless. Cueball then imagines that at the peak of his swing, he is able to become permanently weightless, floating above the ground without any support.

When on a swing or other pendulum rides, there is a moment between swinging up and swinging back down when the forces of gravity, friction, air resistance, etc., bring the velocity and normal force of the swing to zero. At this moment, there is no acceleration toward the pivot of the swing (since the centripetal acceleration is proportional to the square of the speed). So the swinger experiences no centripetal force. Of course, gravity still acts on the person, but if the swing is horizontal at that point, then there is no reaction force, so for one moment, the swinger is in free-fall and experiences weightlessness. However, that weightlessness can only be maintained for a fraction of a second, so if Cueball tried this in real life, he would come crashing to the ground.

In the title text, Cueball asks for a pocket fan, believing he could fly around the yard using this small device as a propeller. By using the fan to blow air in the opposite direction he wishes to travel, he could perhaps use the reaction force to push himself around. Note that this form of travel does not work at high altitudes because it works by pushing air molecules, which decrease in concentration at high altitudes. Another method of propulsion could be machine guns

HEY, WHAT'S YOUR  
CELL NUMBER?

(VIOLET BROWN GRAY) —  
UH, I MEAN, (718)-387-6962.

OKAY, YOU ARE PUTTING  
DOWN THOSE RESISTORS  
AND GOING OUTSIDE  
FOR A WHILE.

THAT'S PROBABLY  
A GOOD IDEA.



(It's the TMBG Dial-a-Song line, to save you some time.)

**Explanation:**

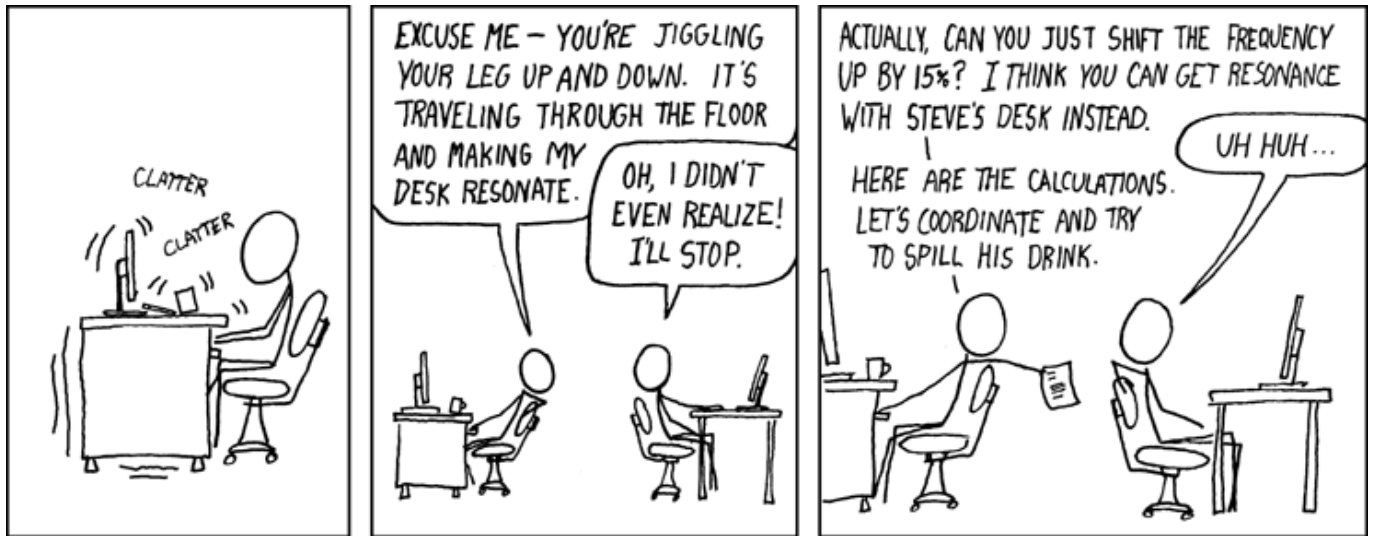
Resistors are electronic components carrying color-coded bands indicating their value

(measured in ohms) and tolerance (e.g. 5%). Cueball has been hunched over his work for so long that, when asked for his phone number (by his Cueball-like friend), he absentmindedly reads out his phone's area code as a sequence of colors found on the aforementioned resistors (each color corresponding to one of the ten decimal digits, in this case 718 – see Resistor color-coding). He realizes his mistake after these first three digits and begins again using numbers to state the entire phone number. His friend points out that such a mistake means it's a good time to take a break, and Cueball concurs.

It's not uncommon for readers to try calling phone numbers they see inside a book or a comic strip, just to discover what it actually goes to. Randall foresees this, and in the title text he simply tells you what the phone number is. TMBG is They Might Be Giants, an alternative rock band responsible for toe-tapping chart-topping "Birdhouse In Your Soul." At one point, they recorded individual songs on an answering machine and advertised the phone number so people could call and listen to the song on the machine. Hence, Dial-A-Song. However, the number was changed to (844)-387-6962 in 2015. TMBG has also created a website with the same function: <https://dialasong.com>. Resistor color codes were mentioned again in 992: Mnemonics and 1604: Snakes.



## #228: Resonance



It's really hard to control the frequency, actually.

### Explanation:

Resonance is the tendency for an object to oscillate when energy is transferred to it at a specific set of frequencies known as harmonics of the natural frequency of the object. A simple example of this is pushing a child on a swing: by pushing the child at the right moment, more and more energy is transferred to the system and the amplitude of the oscillation grows, making the child swing higher.

In this comic, the friend is jiggling his leg up and down at a harmonic of the natural frequency of Cueball's desk. This causes Cueball's desk to vibrate more and more until objects on it start to bounce around. Rather than have the friend stop, Cueball wants him to slightly increase the frequency of the jiggling in order to spill the drink on Steve's desk (not pictured). In xkcd, no one (except Adam) likes Steve, as demonstrated in comics 1532: New Horizons and 1672: Women on 20s as well as this one. However, it is hard to have a person control a subconscious movement exactly, let alone increase or decrease by exact figures.

In the title text, his friend confesses the obvious fact that he couldn't control the frequency very well. (Alternatively, Randall may have made this observation himself through experimentation.)

## #229: Graffiti



I THINK I LOOK FOR MEANING  
IN THE WRONG PLACES SOMETIMES.

FOR AN INTRIGUING TIME CALL

### Explanation:

The humor in this comic comes from the irony of a deep philosophical musing on the

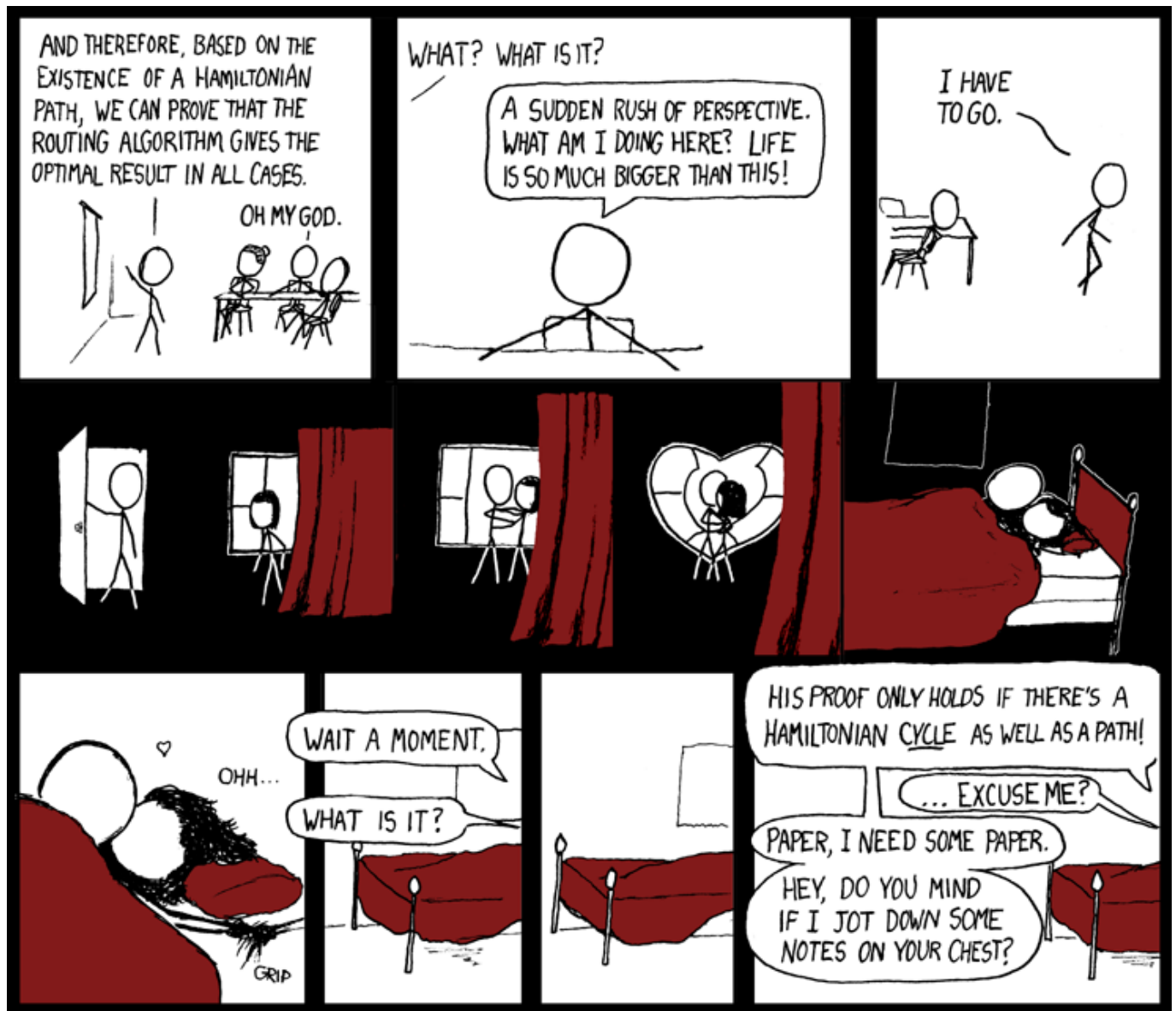
nature of individuals sharing a private space in a public place, unknown to one another and separated by time. The graffiti text is juxtaposed with more common bathroom stall scrawlings - insults, slurs, and "[Name] was here."

This comic makes use of the existential idea of "finding meaning where you look for it," a recurring theme in xkcd. The caption implies that a bathroom stall isn't a place where Randall would like to find meaning in life, so he shouldn't look for it there.

The title text parodies one of the archetypical pieces of graffiti: "For a good time, call [phone number]," which indicates that the person reachable at that number is available for prostitution, casual sex, and/or phone sex. However, 'good' has been replaced with 'intriguing,' implying that instead of sex, the writer is offering witty and insightful conversation.

There may be a reference to this comic in 1810: Chat Systems with the chat system called Wall (bathroom).

## #230: Hamiltonian



The problem with perspective is that it's bidirectional.

### Explanation:

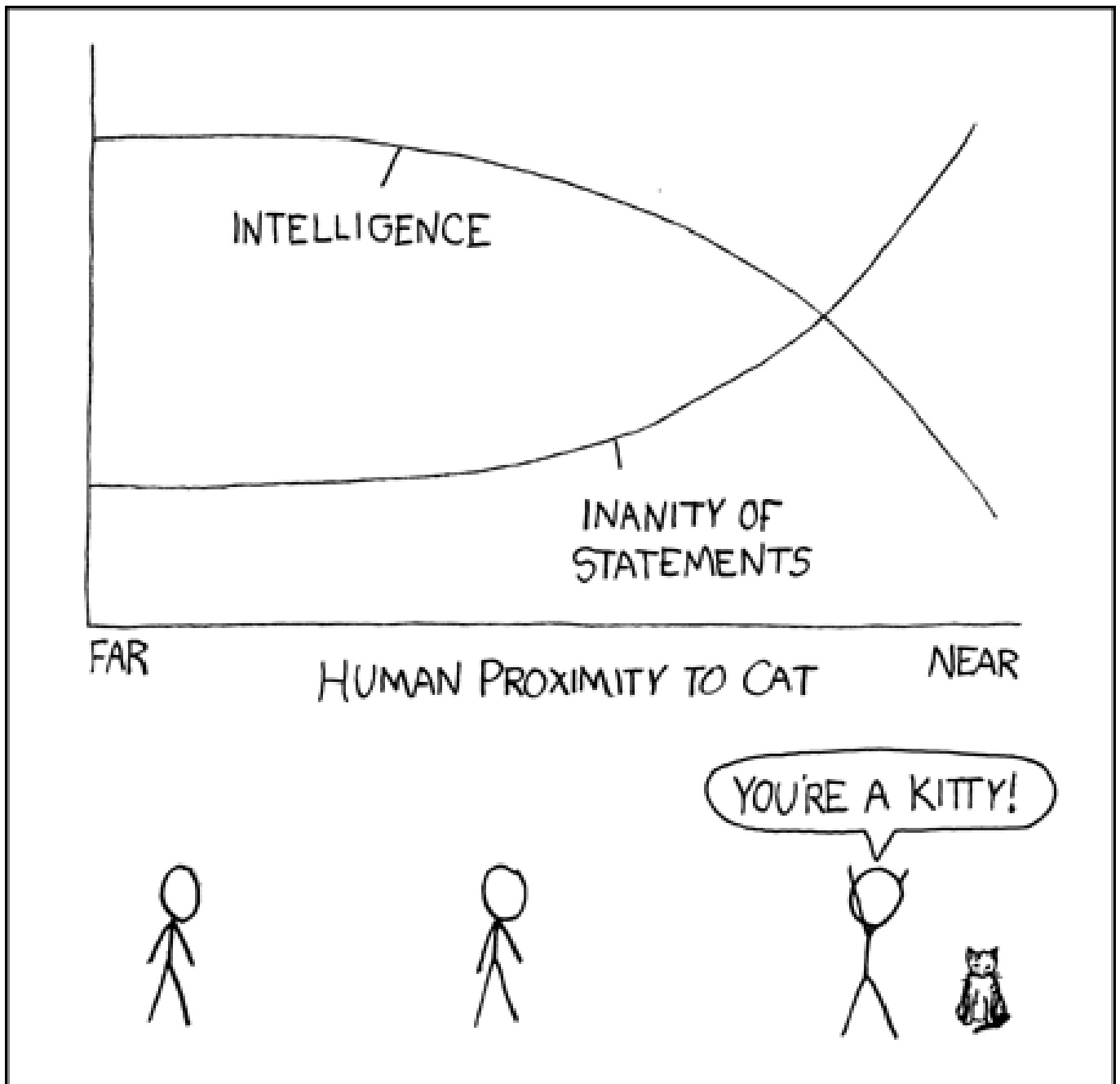
Cueball, presumably in class, decides that the subject of optimizing routing algorithms is not important in the larger context of life and love. However, he later realizes while in bed with Megan that there is a flaw in the proof presented, and suddenly wants to focus on the mathematics again, in a humorous reversal of his position about what is meaningful.

In graph theory, a Hamiltonian path is a path that connects all the vertices (nodes) and passes through each one exactly once. (Think connect the dots with rules!) A Hamiltonian cycle is a Hamiltonian path such that the final vertex is adjacent to the initial one (intuitively, it "begins and ends with the same vertex," but recall that paths are required to only pass through each vertex once). The presenter is using graph theory to optimize a routing algorithm by solving a Hamiltonian path problem. Cueball's realization is that the proof he had followed in part actually requires a Hamiltonian cycle, not just a path, so the presenter's proof of the existence of a Hamiltonian path is

insufficient to solve the problem.

The title text plays on a dual interpretation of bidirectional: just as any graph cycle can be traversed in two directions, a change in perspective can be traversed in two directions (from mathematics to love, and then from love to mathematics).

## #231: Cat Proximity



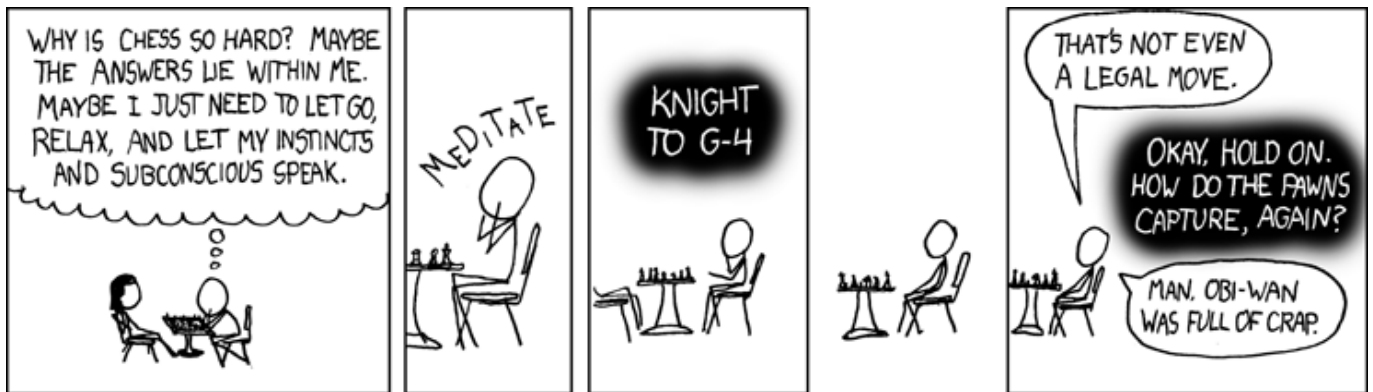
Yes you are! And you're sitting there! Hi, kitty!

### Explanation:

This comic refers to the use of "baby talk" when speaking to pets, especially cats. A person's voice becomes falsetto and cooing, vocabulary becomes simplified, and phrases are repeated, such as "Here, kitty, kitty, kitty." The chart shows that a person's apparent intelligence decreases, and that the inanity (i.e. uselessness or emptiness) of their statements increases, the closer they get to a cat. Most people act like this when they're playing with cats or trying to call them over to them. Thankfully, being close to a cat doesn't actually cause any decrease of intelligence in normal circumstances.[citation needed] In 1535: Words for Pets, Randall mentions again how people often talk strangely to their pets. Typing "cat" in unixkcd will print "You're a kitty!", a reference to Cueball's line in the comic.

The title text continues Cueball's obvious statement (and thus inane/useless point made) from below the graph.

## #232: Chess Enlightenment



You know that 'sweep the pieces off the board and see it in your mind' thing? Doesn't work.

### Explanation:

In this comic, Cueball finds his game of chess against Megan to be too difficult, and he attempts to tap his subconscious to find his next move. This is a common technique used in more physical competitions like baseball or golf, where overthinking can interfere with one's motion and thus "clearing one's mind" and relying on the subconscious is useful to overcome such mental barriers. However, chess is more a game of planning and strategy than natural movement, and the rules of chess are not ingrained into Cueball's subconscious, and so his subconscious ends up feeding him invalid moves and beginner questions concerning movement rules.

Chess is a board game in which two players take turns to move a variety of different pieces representing units on a battlefield to try to checkmate the other player's king. Chess has a lively tournament scene, and it takes much practice to attain a competent level of skill in the game. Different pieces can move and capture in different ways; pawns can only move forward by one square unless it's their first move, in which case they can move up two squares. They can only capture by moving diagonally, including when capturing en passant, in which case they move behind an opposing pawn that had moved forward two squares on the previous turn. Other pieces have different rules.

Cueballs subconscious instructs him to play the move "Knight to G-4". Chess uses a coordinate system to mark specific squares. The letters A through H represent the X line, and the numbers one through eight are the Y line. There are three reasons a Knight to G-4 could be an illegal move. The first being that the Knight couldn't travel to the space (as Knights movement is limited to a select few squares on any given turn). The second reason being that it could bring his King into Check. If the Knight is blocking (or pinned by) something like a Rook from attacking the King, then moving the Knight and allowing the King to be attacked is illegal. The third reason would be that another piece of the same color is already in that square, which doesn't allow the Knight to move there.

Obi-Wan Kenobi is a character from the movie series Star Wars who played the mentor figure to the protagonist, Luke Skywalker. One of his pieces of advice to his mentee was to relax and listen to his subconscious in strenuous times. However, Obi-Wan gave this advice because Luke was connected to The Force, a mystical energy in the Star Wars universe that connects to the entire universe; not being a part of the Star Wars universe,



Cueball is unable to tap into it. The Force does have similarities to real-life concepts used in various Eastern philosophies, but they are not typically used to play chess, for the same reasons given above.

The title text refers to a scene in the chess movie *Searching for Bobby Fischer*, in which Sir Ben Kingsley's character dramatically sweeps the pieces off the board and instructs his student to see the pieces in his mind, which the child proceeds to do. Randall considers this impractical, presumably for similar reasons as the Obi-Wan example.

## #233: A New CAPTCHA Approach

TO COMPLETE YOUR WEB REGISTRATION, PLEASE PROVE  
THAT YOU'RE HUMAN:

WHEN LITTLEFOOT'S MOTHER DIED IN THE ORIGINAL  
'LAND BEFORE TIME,' DID YOU FEEL SAD?

☐ YES

☐ NO

(BOTS: NO LYING)

They'd use that *Futurama* episode with Fry's dog, but even spambots cry at that.

### Explanation:

A CAPTCHA is a verification system to stop automatic submissions to web forms by asking the user to do something a computer program could not do, such as type a distorted word into a box.

But here, the author has a new CAPTCHA, in which it references a sad event in the children's movie, *The Land Before Time*. It asks the subject if it felt sad. If the subject is human, then they most likely will have felt sad, so the answer will be "yes." If it's a computer program, however, it is supposed to answer "no," because computer programs cannot feel. This CAPTCHA would be extremely easy to break, however, because a computer could easily find the "yes" button and press it. However, the "trap" is that a computer program doesn't "know" that it's supposed to answer "yes," as it lacks human emotion and empathy. It is similar to the way that humans are very good at being shown simple drawings of an object or an action and being able to tell immediately what it is, while computers can't. The "no lying" instruction is ostensibly meant to patch that hole, but unfortunately, it turns out that spambots are not generally programmed with the Three Laws of Robotics.

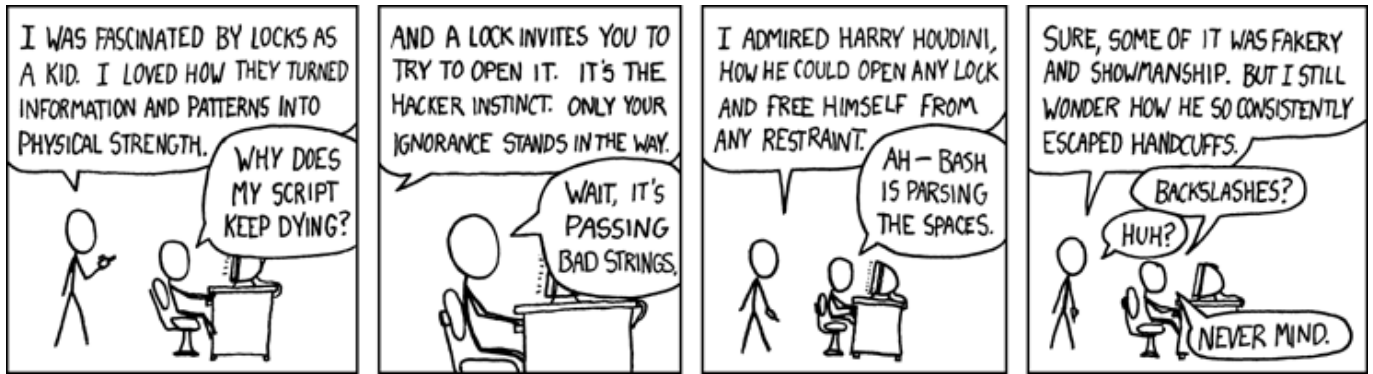
This is also a reference to a common remark after watching a film or other production with sad parts -- "If you didn't cry at [X], you're not human".

Another reason why a CAPTCHA like this won't be very practical is that some humans haven't necessarily seen the movie in the question and would be unable to know if they did feel sad or not. For all they know, Littlefoot's mother could be a terrible person about whose death they should be happy or at least relieved.

The title text references the *Futurama* episode "Jurassic Bark". It claims that this episode

is so sad that even spambots cry after seeing it.

## #234: Escape Artist



Easier to escape: n-layered nested quotes or an iron maiden?

### Explanation:

Harry Houdini (born Erik Weisz/Ehrich Weiss) was a famous escape artist, whose more famous routines included escaping straitjackets and switching places with an assistant while locked inside a box.

The word "escape" also has a meaning in computer science. To "escape" something in programming means to replace a character or character sequence that would usually have a special meaning with another character sequence that doesn't have this special meaning. One common way of escaping is to have a special escape character that removes the special meaning from whatever character follows it. For instance, many programming languages enclose text strings in quotation marks (e.g. "this is a string"). If you tried to directly put a quotation mark inside the string, the compiler would interpret it as the end of the string. To avoid this, the quotation mark is escaped with a backslash: "He said, \"Goodbye!\", and went away."

The problem Cueball is having is related to the fact that the Bash shell interprets spaces as a special syntactic marker, when he actually just wants the spaces to be literal space characters. In this case, escaping the spaces with \ would force Bash to interpret his script in this way.

(There is one other way the escape character is sometimes used, but we'll ignore it for the sake of explaining the comic.)

The person talking to Cueball is having a separate conversation about Houdini as Cueball thinks aloud about his script issue, which results in diverging conversations. This eventually leads Cueball to suggest that Houdini might have "escaped" (freed himself from) handcuffs by "escaping" (removing the special meaning from) them with backslashes.

Sometimes, escape characters need to be "nested" - the backslash character itself can be escaped as \\ to produce a literal backslash, so if, for example, one needs to produce a literal quotation mark to output to a script file, and that script file also needs to have the quotation mark escaped, one would need to type it out as \\", which would be output as \". If I needed to actually output that \\", one would need to type it as \\\\". The number of backslashes needed grows, and can be very hard to keep track of (see 1638: Backslashes). This behavior is a type of n-level nested quotation mentioned in the title

text. This could, in practice, be very easy with syntax highlighting showing where the parser sees the string as ending, making it trivial to escape out the characters that should be escaped, e.g.:

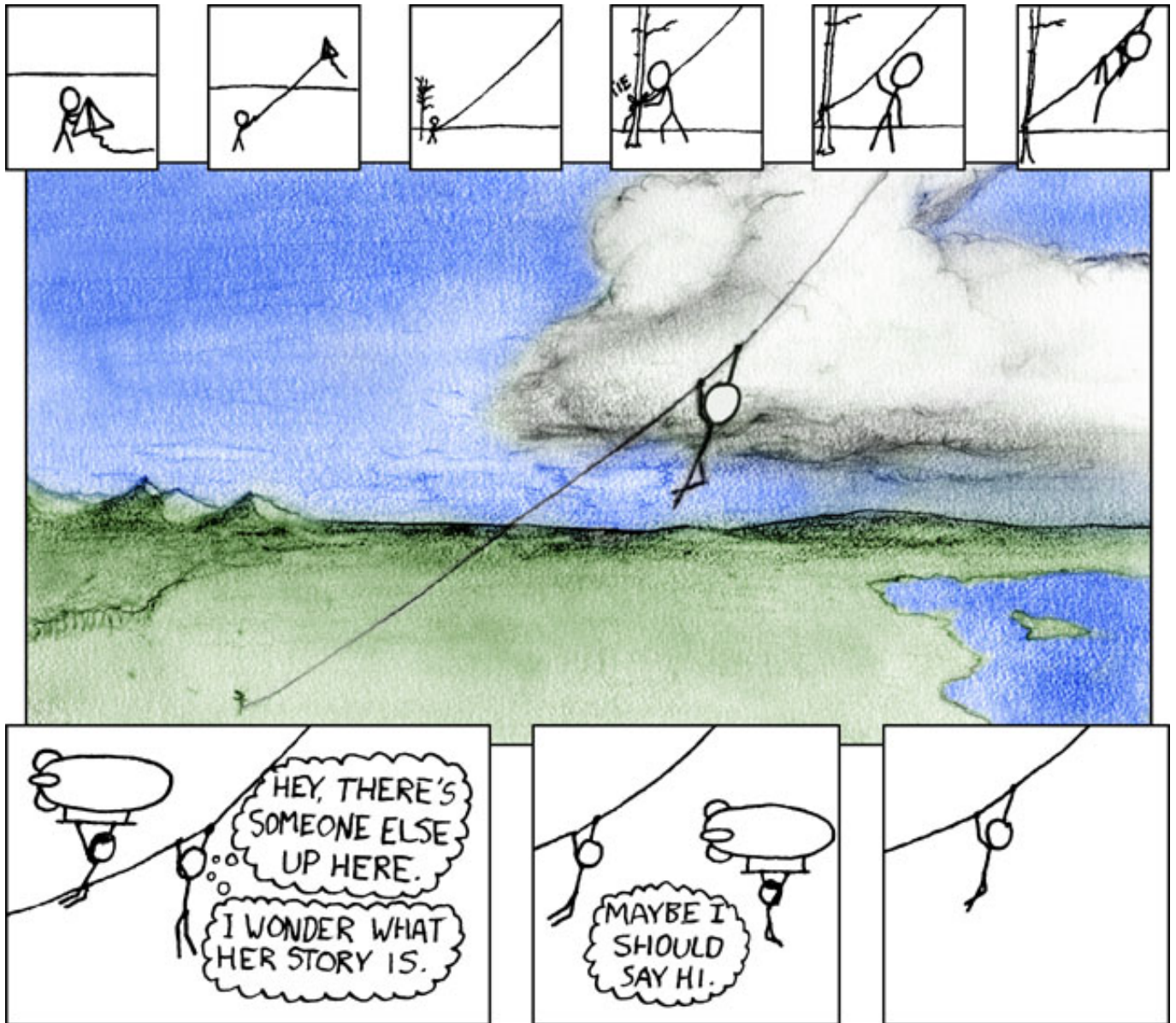
"And then he said \"Hi\"."

In this example, the nested quotes could be escaped until the editor shows the uniform color of strings.

An iron maiden is supposedly a medieval torture device, currently believed to have been invented for tourism purposes much later than the time period when it was said to have been used.

Harry Houdini's escapes include an escape from a purported "iron maiden," although it only vaguely resembles the "medieval" torture device.

## #235: Kite



It's easy to regret your awkward conversations but hard to regret the ones you didn't have.

### Explanation:

This comic presents, through a surreal scenario, one of Randall's recurring themes: that it is better to take a chance and make an interesting choice.

Cueball flies a kite, then fixes it to a tree and climbs its string. In real life, of course, the string would not be able to support the weight of a human.[citation needed] Up in the sky, Megan appears hanging on a blimp, looking at him throughout the encounter. Cueball wonders about her and considers talking to her, but he does not act. After she has gone, Cueball is alone again; nothing has changed.

The title text explains the meaning of this metaphor. It is easy to regret an awkward conversation you had. In contrast, you don't regret the conversations you didn't have the nerve to start, because their cost is invisible-yet, they may have been missed

opportunities, possibly a much higher cost than a simple awkward conversation.

Later in the 1614: Kites title text, it turns out that other people (Beret Guy) can also fly with a kite.

# MY HOBBY:

STANDING IN THE SUPERMARKET'S PRODUCE  
SECTION HOLDING A TUBE OF K-Y JELLY,  
LOOKING CONTEMPLATIVE.



Fun game: find a combination of two items that most freaks out the cashier. Winner: pregnancy test and single coat hanger.

## Explanation:

There's a fairly well-founded meme that singles looking for other singles can make connections with others in the fresh produce sections of a supermarket. From a single lady's point of view, men who are buying such goods are more likely to be unattached, due to the traditionally skewed gender politics of who shops for what in a couple, and at



the same time, the man is exhibiting good habits in not merely stocking up on ready-meals or subsisting on takeaways while living the bachelor life.

By standing in a produce aisle with a tube of K-Y Jelly (which is most commonly used as a sexual lubricant) in his hand and considering what produce to buy (between bananas, apples, oranges, zucchinis, and doubtless much more off-screen), Cueball is allowing other people to believe that he either has plans to have sex with any connection he might manage to take home with him, or also he plans to use the chosen produce item to pleasure himself, probably sexually.

Cueball is probably not actually planning on doing either,[citation needed] but he loves to see the look on people's faces; hence, he's collecting double-takes.

In the title text, he says he likes to play a game of "freak out the cashier using two items." Wire coat hangers have been used to perform do-it-yourself abortions, many times with disastrous effects, such as internal hemorrhaging and the death of the woman. The combination of a pregnancy test and a coat hanger will be concerning to any cashier, regardless of their opinion on abortion, for this reason; it will be doubly concerning for a pro-life cashier.

## #237: Keyboards are Disgusting



Alternate method: convince them to pretend it's an Etch-a-Sketch and try to erase it.

### Explanation:

Ever cleaned a leopard? They're filthy.

This comic refers to the fact that many keyboards, especially desktop keyboards, gather large amounts of crumbs and are rarely cleaned. In the comic, a person (probably Black Hat) tricks an unsuspecting character into lifting his keyboard up so that all the crumbs fall down onto his face. By tricking the victim into de-focusing, the prankster ensures that the victim will not notice the crumbs coming out of the keyboard until it is too late, perfecting a quality online prank.

The title text references the toy Etch A Sketch, in which you would draw lines using two knobs and shake the Etch A Sketch upside down to clear the screen. If you shook a gross keyboard upside down over you, you would get filth on you as well.

The cleanliness (or lack thereof) of keyboards is mentioned in the title text of 1395: Power Cord.

# PET PEEVE #114:

REALLY? WHAT ARE YOU  
DOING READING? IT'S  
SATURDAY NIGHT!



I'm reading a goddamn book, thank you very much.

## Explanation:

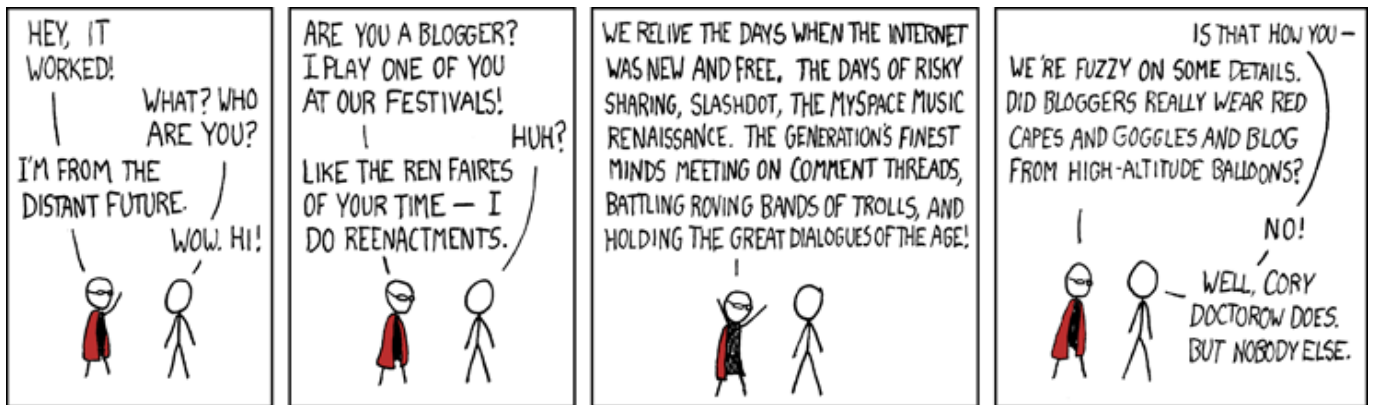
A pet peeve is a minor annoyance that an individual identifies as particularly annoying to them, to a greater degree than others may find it. Cueball counts his pet peeves; this is number 114.

Cueball's friend calls him and finds out that he is reading a book on a Saturday night. Some consider Saturday nights, or the weekend in general, to be a time for enjoying or partying with friends after five weekdays of work. But Cueball is annoyed by the fact that people are stuck with the stereotype of partying out on weekends. In his view, reading a good book is also a great way of enjoying the weekend. His annoyance is

expressed in the title text.

This was the first time Randall mentions his many Pet Peeves. Although the next already appeared in 283: Projection four months later, still in 2007, it is a slow growing list, but one has been added roughly every other year since then, the fifth coming towards the end of 2018 in 2080: Cohort and Age Effects.

## #239: Blagofaire



Things were better before the Structuring and the Levels.

### Explanation:

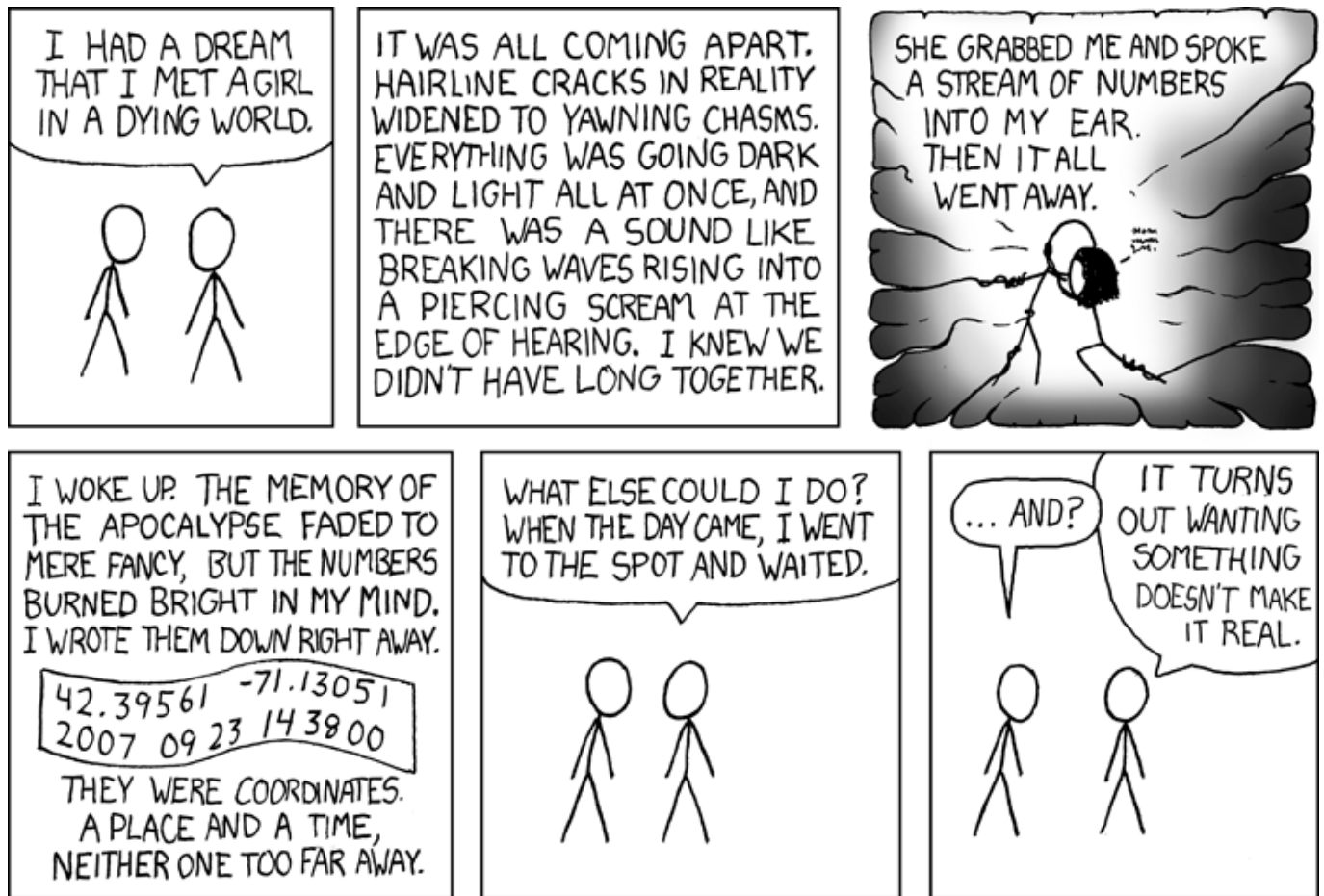
Facts become distorted as time moves forward. What do we know about the Elizabethan times? They spoke strange English. What will 400 years from now think of the first twenty years of the Internet? Crazy people said crazy things online. Will we even say "online" 400 years from now? Won't the internet be everywhere, and everyone on it all the time in their retinal implants that being "offline" will seem absurd? Particular facts that this reenactor seems to have confused are:

- "battling roving bands of trolls." Trolls in fantasy refer to monstrous creatures that are often antagonists who do battle with heroes. However, online trolls refer to disruptive members of discussion boards.
- "The generation's finest minds meeting on comment threads, [...] and holding the great dialogues of the age!" As Randall has pointed out in other comics (202: YouTube, 301: Limerick, and 481: Listen to Yourself), the discussions that take place online are often very poor examples of intellectual discourse.

"Ren Faire" is short for "Renaissance Faire", described as "an outdoor weekend gathering, usually held in the United States, open to the public and typically commercial in nature, which emulates a historic period for the amusement of its guests." While Cory Doctorow is not in this comic, the character is cosplaying him. This comic inspired several xkcd readers to give Cory Doctorow a red cape and goggles when he won the 2007 EFF Pioneer Award. Cory Doctorow's balloon is featured in 482: Height. The title "Blagofaire" might be an amalgamation between Blogosphere, Medieval Faire, and Blag, Randall's way of referencing his blog. The same topic is mentioned in the title text of the second image of the what if? article Facebook of the Dead, which say: "An elderly Cory Doctorow cosplaying by wearing what the future thinks he wore in the past.". The "festival" the cosplayer references is later referenced in 771: Period Speech.

The title text is probably the future cosplayer referring to the state of the future internet, indicating some organizational structure that constrains and stratifies it, and his preference for what he perceives as the wild and unfettered internet of the past.

## #240: Dream Girl



No matter how elaborately you fool yourself.

### Explanation:

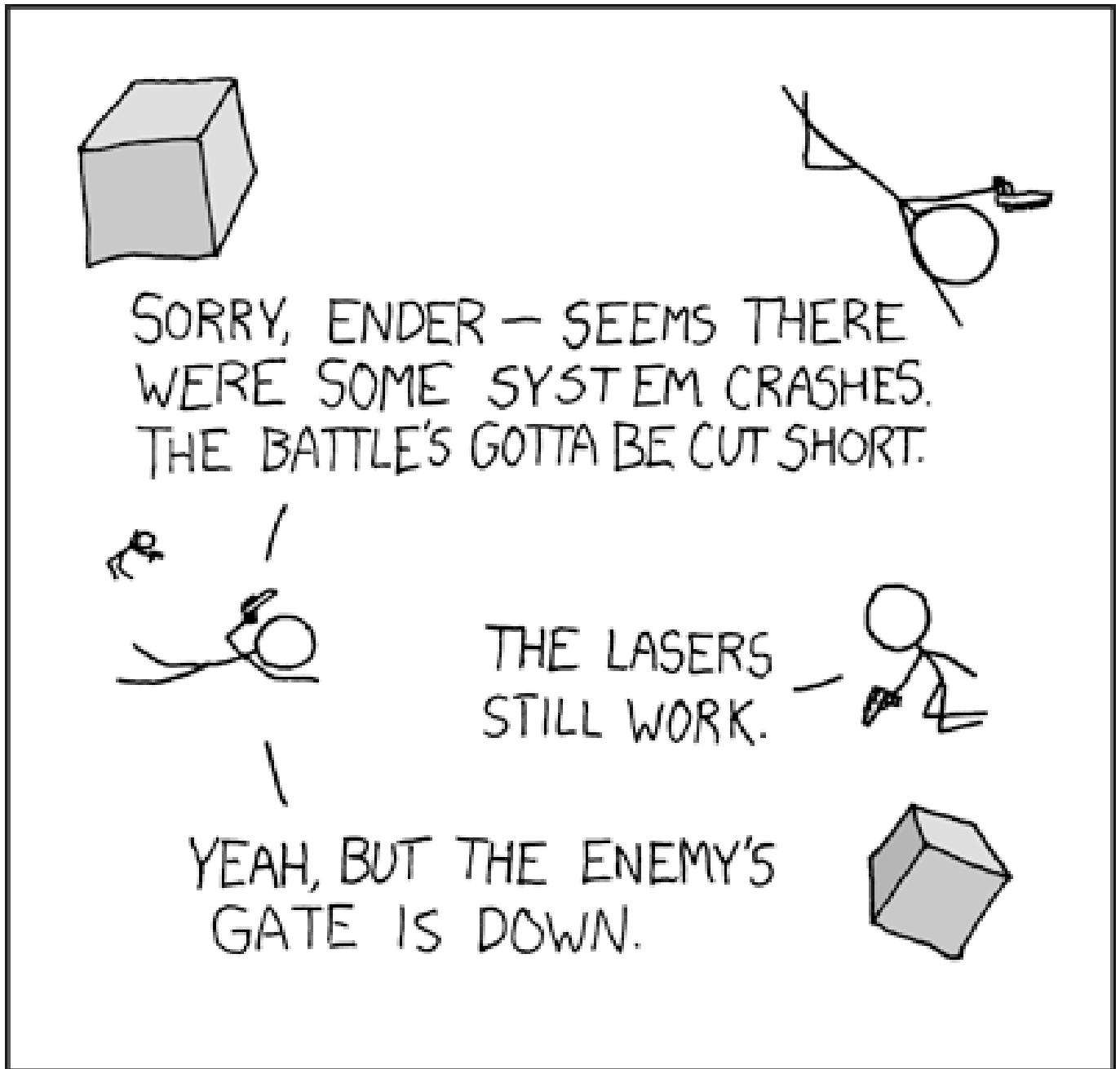
This comic is a commentary on people who dream, daydream, and wish for things to happen, commonly in a romantic context. Cueball dreams of a girl who gives him a time and a place, and the last panel implies that he went to that place at the given time, but did not find the girl. The strip builds up hope and anticipation that this supernaturally romantic reunion will occur, but grounds the reader with the last line of the comic and the title text.

The coordinates of the note lead to Reverend Thomas J. Williams Park in Cambridge, MA, USA. The time on the note, September 23, 2007, was about six months after the publishing of this comic. One hundred eighty-one days, to be exact.

Notably, several hundred xkcd fans met up at that very time and place. Randall also visited the meetup, and was recorded as saying "Maybe wanting something does make it real."

The idea that the frame of the comic grabs the people inside was already used in comic 82: Frame.

## #241: Battle Room



Bean actually sabotaged it just to give Dink the excuse to make that joke.

### Explanation:

The book *Ender's Game* by Orson Scott Card is about Ender Wiggin, a boy of extraordinary intelligence, who is recruited to be trained to be one of the commanders of Earth's "Defense" Fleet. The Fleet serves to protect Earth should the aliens known as "Buggers" invade again. (Future books renamed the Buggers to the Formics, since in British English, "bugger" is a swear word meaning to engage in anal sex, and an insult, as in "you silly bugger"). Ender is taken to a space school called Battle School. At the center of Battle School is the Battle Room, where all the training revolves (literally and figuratively) around. *Ender's Game* has also been discussed in later comics like 635: Locke and Demosthenes and 304: Nighttime Stories.

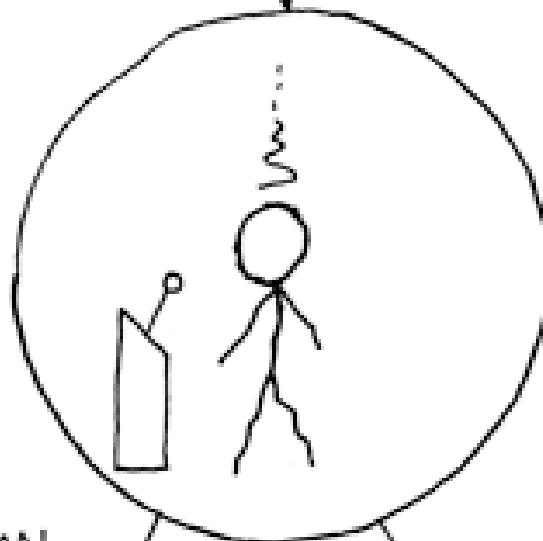
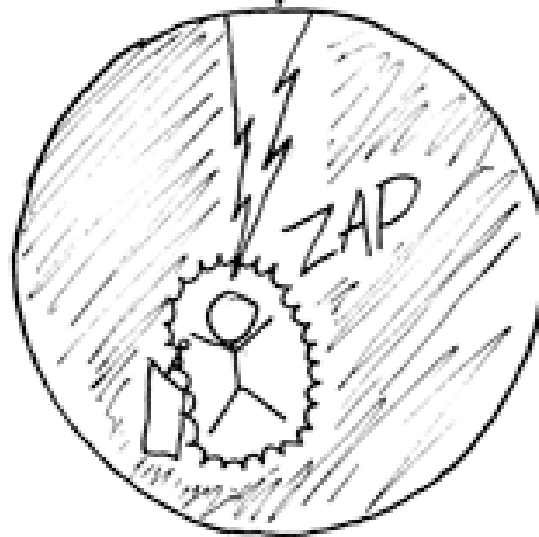
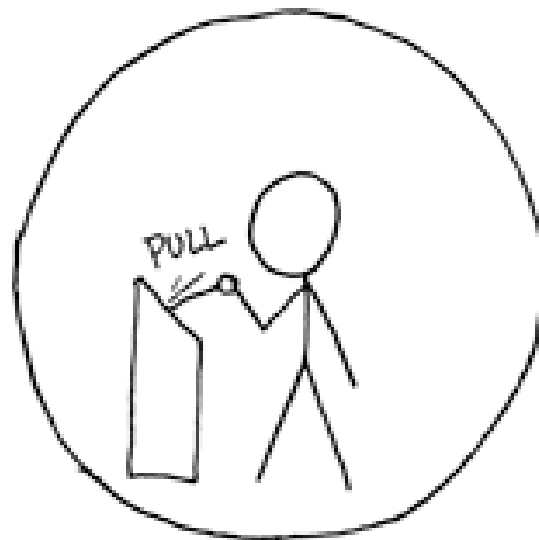
The Battle Room is described as a hollow perfect cube. "Stars" (smaller cubes) can be pulled from the walls (without changing the shape, more stars come in to fill the space where the old ones were) and can be used as obstacles in the Battle Room, as they will remain absolutely stationary, no matter what force is exerted on them. There is no gravity in the Battle Room. Most squads entering the Battle Room keep their orientation from the hallway (gravity in the hallway dictates where "down" is in the Room). Ender realizes that because the room is a perfect cube, and that even the entrances, called "gates," are perfect squares and do not give any hint about which direction is up or down, that keeping that orientation is useless. He instructs his squad to orient so that the enemy's gate is down, a line of lateral thinking that gives his team three big advantages (smaller targets, "shielding" themselves with their own feet, and unprecedented angles of attack) and leads them to a perfect winning streak.

The joke here, as made by Ender's squadmate Dink, is that the enemy's gate is "down," as in broken. A computer or a website is said to be "down" when it stops operating or is unavailable, due to a cause such as a crash, the power is cut, or it is being taken offline for maintenance.

The title text suggests that the enemy's gate was sabotaged by Bean, another, possibly even smarter, friend of Ender's, for the sole reason of allowing Dink to make the joke. This reflects the developments in Ender's Shadow, the parallel story to Ender's Game, which showed that Bean was manipulating many of the events of the original book.



## #242: The Difference



NORMAL  
PERSON

SCIENTIST

I GUESS I  
SHOULDN'T DO THAT

I WONDER IF  
THAT HAPPENS EVERY  
TIME

How could you choose avoiding a little pain over understanding a magic lightning machine?

**Explanation:**

Cueball pulls a lever. A bolt of lightning comes down and strikes him.

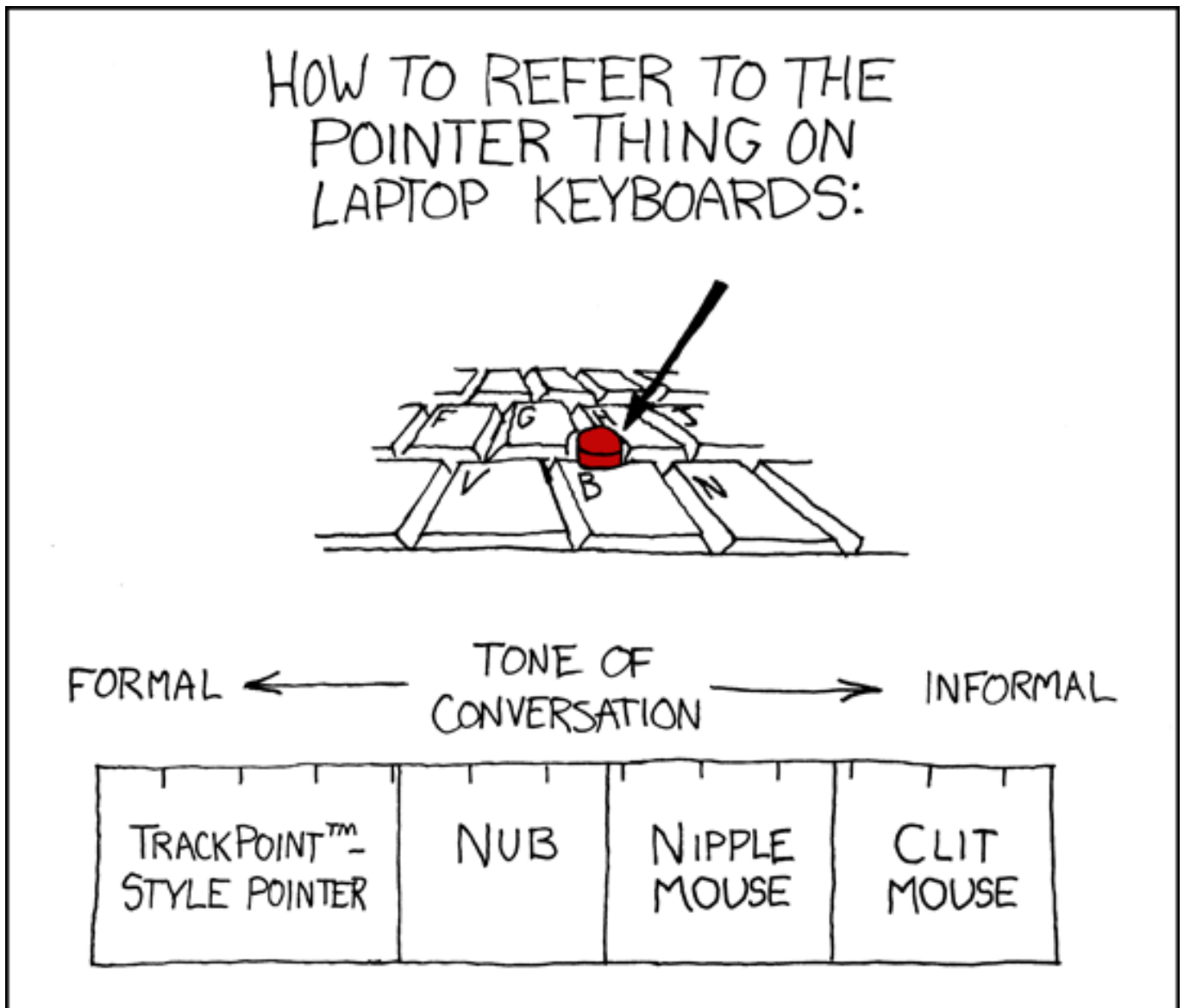
After being dazed for a moment, the comic then takes one of two routes; the first is that of a normal person, the second that of a scientist.

In Randall's example, the normal person would decide not to pull the lever anymore, because it seems to cause him to get struck by a bolt of lightning.

But the scientist would pull the lever again to see if it was just a coincidence or if the lever actually caused the bolt of lightning. A scientist requires that results be repeatable before he accepts the results.

The title text refers to the scientist's method of pulling the lever again and again, trying to understand how the machine works, as opposed to the normal person, just avoiding pain. This could be a nod towards how scientists sometimes go to extreme measures for knowledge.

For a different view on the topic of repetition in experimentation, see 1657: Insanity.



I know a lot of people hate these, but I prefer them to touchpads.

### Explanation:

This is a simple comic offering increasingly not-safe-for-work names for a laptop's pointing device. This stick was an alternative to a mouse, but has largely been supplanted by the touchpad.

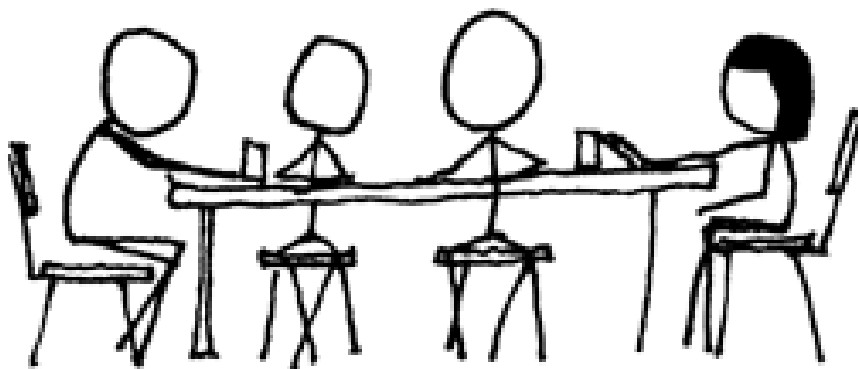
"TrackPoint" is the trademarked term used by IBM (and later Lenovo) for the pointing stick implemented on ThinkPad laptops. They are usually colored red, as in the comic. Other manufacturers have alternative names for their implementations, and typically use different colors. It is obviously the most formal of the four names. The more informal two are nub and nipple mouse (referencing breasts), with the last, most informal being clit mouse, a reference to clitoris (part of the female genitalia).

The title text notes that Randall prefers pointing sticks to touchpads.

YOUR PARTY ENTERS THE TAVERN.

I GATHER EVERYONE AROUND  
A TABLE. I HAVE THE ELVES  
START WHITTLING DICE AND  
GET OUT SOME PARCHMENT  
FOR CHARACTER SHEETS.

HEY, NO RECURSING.



I may have also tossed one of a pair of teleportation rings into the ocean, with interesting results.

### Explanation:

Four people are playing a role-playing game. Megan is the game master (GM), describing the events of the adventure and what happens. The other people control imaginary characters in the game. Cueball attempts to have his character lead other characters in

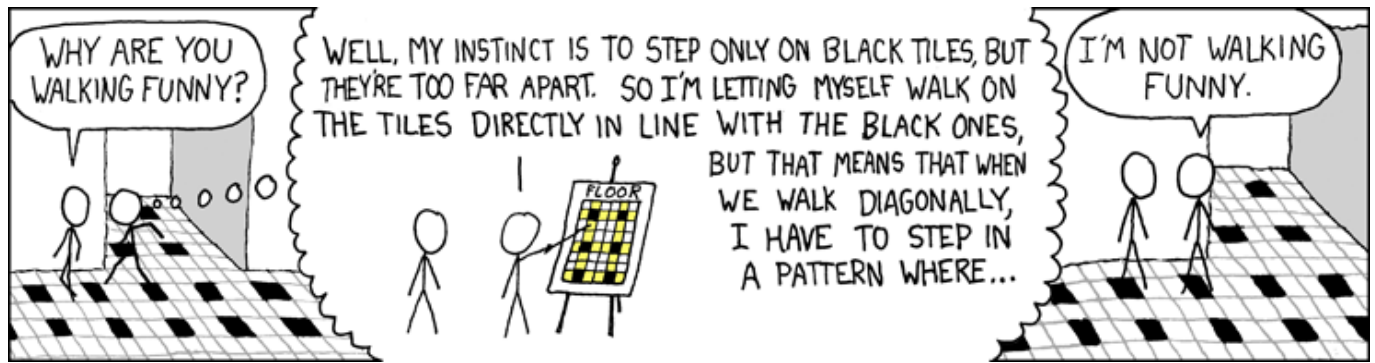
the imaginary construction of dice and gaming sheets. This would allow his character to become the GM of a new game inside the game they're currently playing, effectively taking control of the game away from Megan (at least temporarily). To "recurse" refers to recursion, a concept of computer programming where a piece of code calls itself, essentially making the code run multiple times "within" itself. This may be the simplest way to implement an otherwise long and complicated action. (For example, a folder may contain files inside, but also more folders inside. Asking a computer to 'search through everything' in a folder may involve first checking the files in that folder, and then checking the folders in that folder and 'searching through everything' again in those folders. The single command to 'search through everything' may cause numerous additional 'search through everything' commands to trigger on increasingly nested folders, stopping only once a folder(s) with only files inside (and no folders inside) is found.)

It should be noted that Megan, the current GM, has multiple ways of dealing with this scene to prevent Cueball from attempting to take control of the game. She could simply allude to the success or failure of the recursive game and "skip to the next scene." She could also allow the roleplaying to continue more literally, with crafting checks determining the quality of the miniatures and a gambling check determining the outcome of the in-universe RPG session. Finally, she could simply have the party's plans be interrupted by some sort of threat, or just drop huge rocks on the party.

The title text refers to a pair of fictional rings. Anything passing through one gets teleported instantly to the other, as if the two rings were next to each other. There's an old gamer theory that, if you drop one of the rings in the ocean, water will naturally pass through it and out the other ring, potentially draining the entire ocean, or at least creating a perpetual seawater fountain out of the other ring. And if you teleported one ring directly to the bottom of the ocean, the amount of pressure pushing the water through would cause a gigantic, never-ending torrent, obliterating anything placed in its path. That idea is drawn out in 969: Delta-P. A similar concept is addressed in Drain the Oceans, where a reader asked "How quickly would the oceans drain if a circular portal 10 meters in radius leading into space was created at the bottom of Challenger Deep, the deepest spot in the ocean? How would the Earth change as the water is being drained?". This question may have been inspired by the mention of throwing teleport rings into the ocean in this cartoon.

The rings themselves are most likely inspired by the "Ring Gates" item from the Dungeons & Dragons 3.5 Dungeon Master's Guide (the most recent edition of Dungeons and Dragons at the time this comic was published), which had a similar function. However, a key thing to note is that the rings only allow 100 lbs of material to pass through them each day, meaning that your geyser would only erupt every 24 hours (though this may still qualify as an "interesting result").

## #245: Floor Tiles



The worst part is when sidewalk cracks are out-of-sync with your natural stride.

### Explanation:

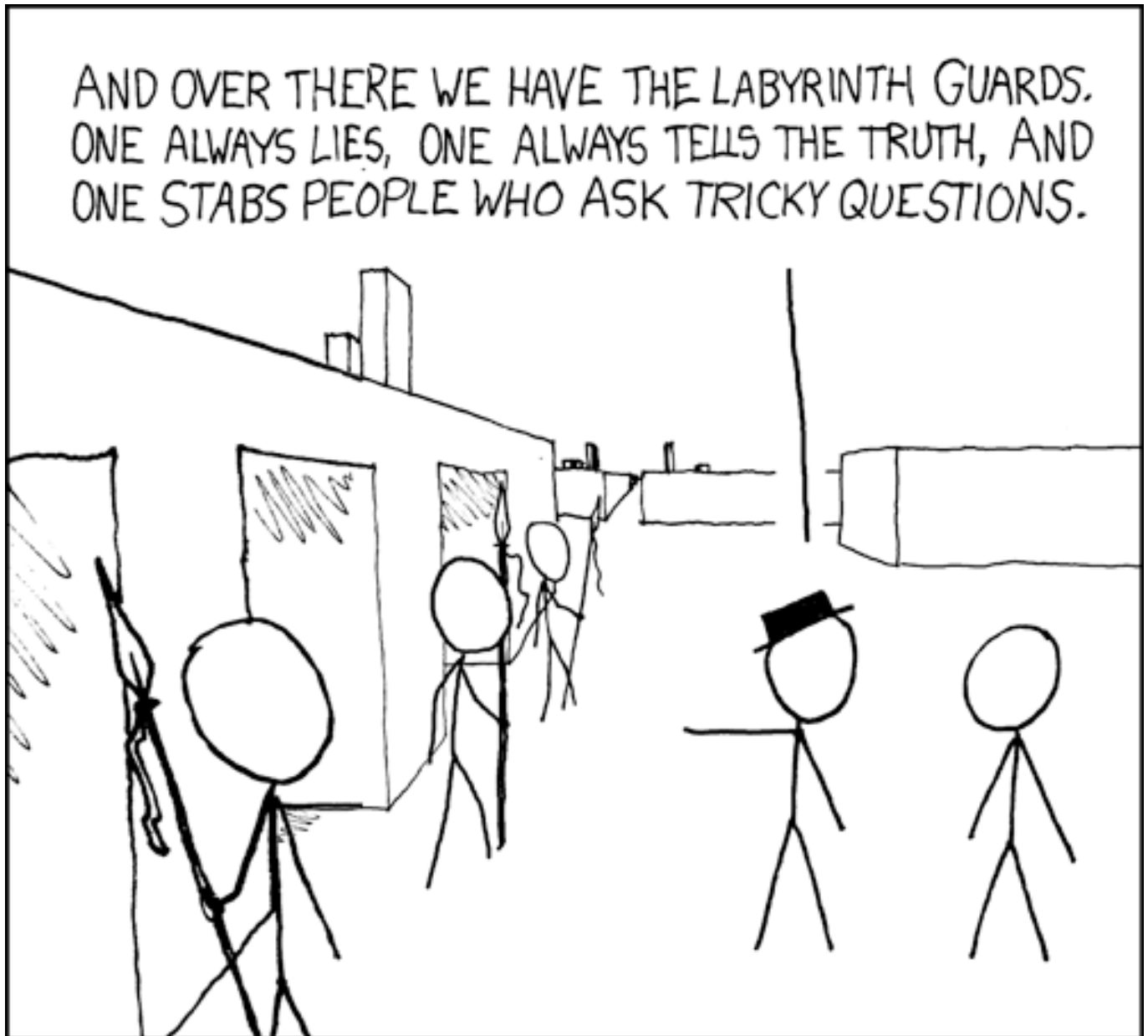
Cueball is walking according to a certain pattern of floor tiles, which makes sense to him in his head (the same pattern was first introduced in 207: What xkcd Means). But as his friend asks him why he is walking funny, he realizes that the algorithm he is using for walking on floor tiles would be so tedious and time-consuming to explain to his friend that he decides instead to simply defend himself and say that he isn't walking funny, this being far simpler than trying to show his friend exactly how his logic works. Alternatively, he is too embarrassed to explain his algorithm.

Cueball has imagined a complex diagram in his head. However, the diagram does not accurately reflect the floor, as the two main rows with black tiles in the foreground are only separated by one row of white tiles instead of two. This could possibly be an error on Randall's part, as the tiles in the background follow the pattern shown in the imagined diagram.

Cueball's rule appears to be that he can step on any black tiles, as well as any white tiles that are horizontally or vertically aligned with them. This forces him to take an abnormal, right-angle path while turning corners rather than rounding them or taking them at diagonals.

The title text refers to a common compulsion often associated with Obsessive Compulsive Disorder (OCD) that leads people to place their feet either exactly between sidewalk cracks or directly on top of them while walking. Indeed, if the cracks are out of sync with one's natural stride, this will cause some people to "walk funny" as they stumble to correct their foot placement.

## #246: Labyrinth Puzzle



And the whole setup is just a trap to capture escaping logicians. None of the doors actually lead out.

### Explanation:

This comic alludes to a famous Knights and Knaves logic puzzle, and specifically to the version featured in the Jim Henson movie *Labyrinth*, with two doors and two guards. One guard always lies, and the other always tells the truth. One of the doors leads to freedom, and you can only ask one guard one question. The solutions to this riddle (and there are several, though all are somewhat similar) involve a tricky question indeed. If you want to give the original puzzle a try for yourself, don't read the spoilers below.

- Solution 1: Ask one guard (it doesn't matter which one) which door the other guard would say leads out. Both guards will indicate the same door, which will be the door that doesn't lead out: the truthful guard knows the lying guard would point to the door that leads to certain death, and says so, while the lying guard, knowing the truthful guard



would point to the right door, says the opposite, indicating the door to certain death.

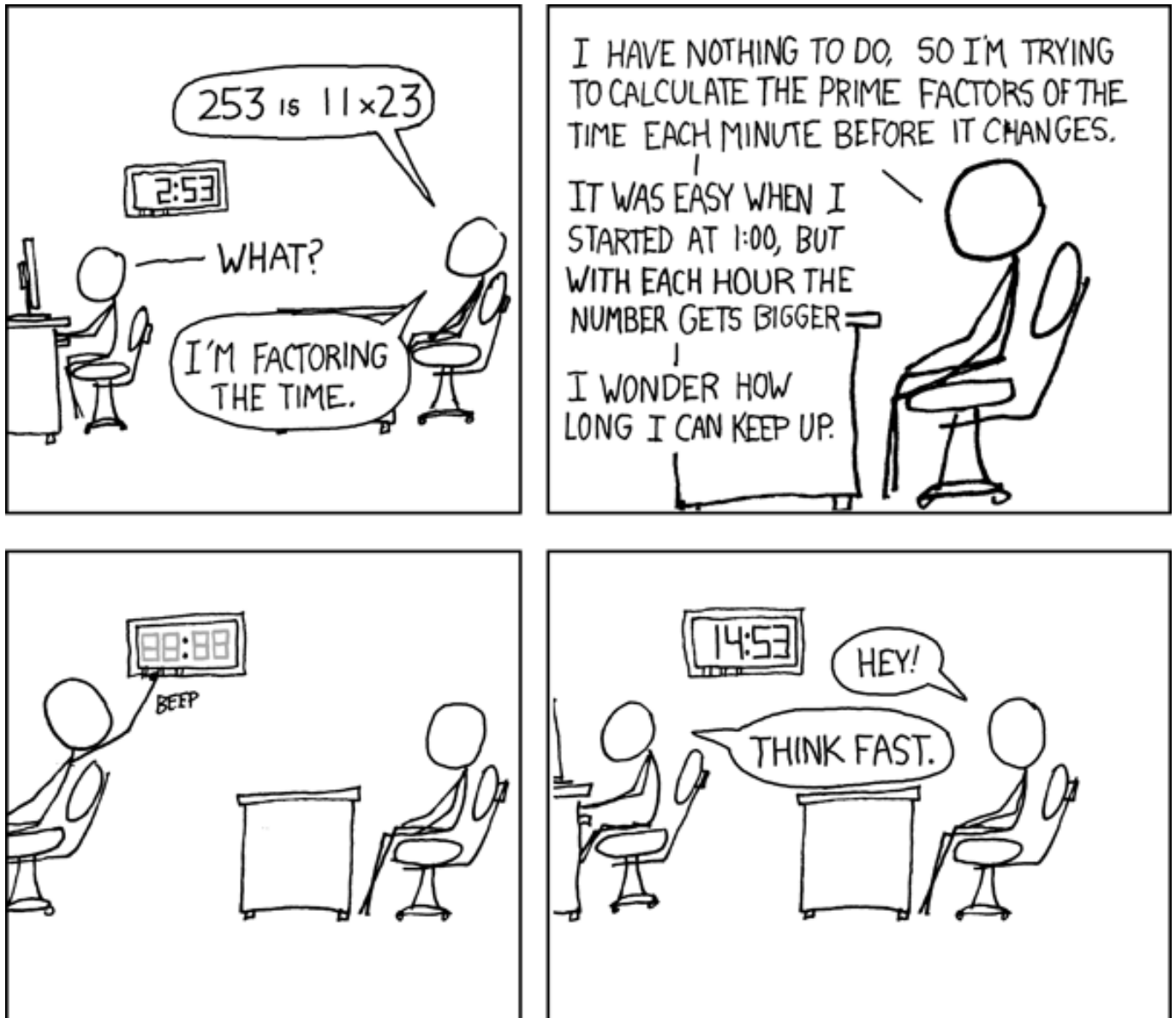
- Solution 2: Ask one guard (it doesn't matter which one) what his answer would be if asked what door leads to freedom. Again, both guards will indicate the same door, which is indeed the door to freedom: the truth guard would, straightforwardly, tell you the truth, while the liar, if asked what door leads to freedom, would point to the opposite, and, if asked his answer, must give the opposite of that — the true door.

Notably enough, both solutions require that the guards be aware of each other's practice regarding truth and lies, which is not stated in the riddle itself. There's another unspoken rule: that the lie is either a yes or a no. If you asked the liar something, he could lie and say, "I don't know," which would leave you with nothing.

Black Hat added a third guard here who would stab his spear to Cueball on every tricky question. But even if the questions from before are not tricky enough to get stabbed, there would be no helpful answer. And if Cueball asks one of the other guards, the answers can't help to find the correct door. The only saving grace is that Black Hat has seemingly forgotten to impose the limit of a single question, but depending on how stab-happy the third guard is or is not, this may not be enough.

The title text presents a typical behavior of Black Hat — no door in fact does lead out of this labyrinth. (Neither door is correct in Labyrinth, either; people paying close attention will note that since the guards themselves explain the premise, even though one of them supposedly always lies, they can't possibly be taken at face value.)

## #247: Factoring the Time



I occasionally do this with mile markers on the highway.

### Explanation:

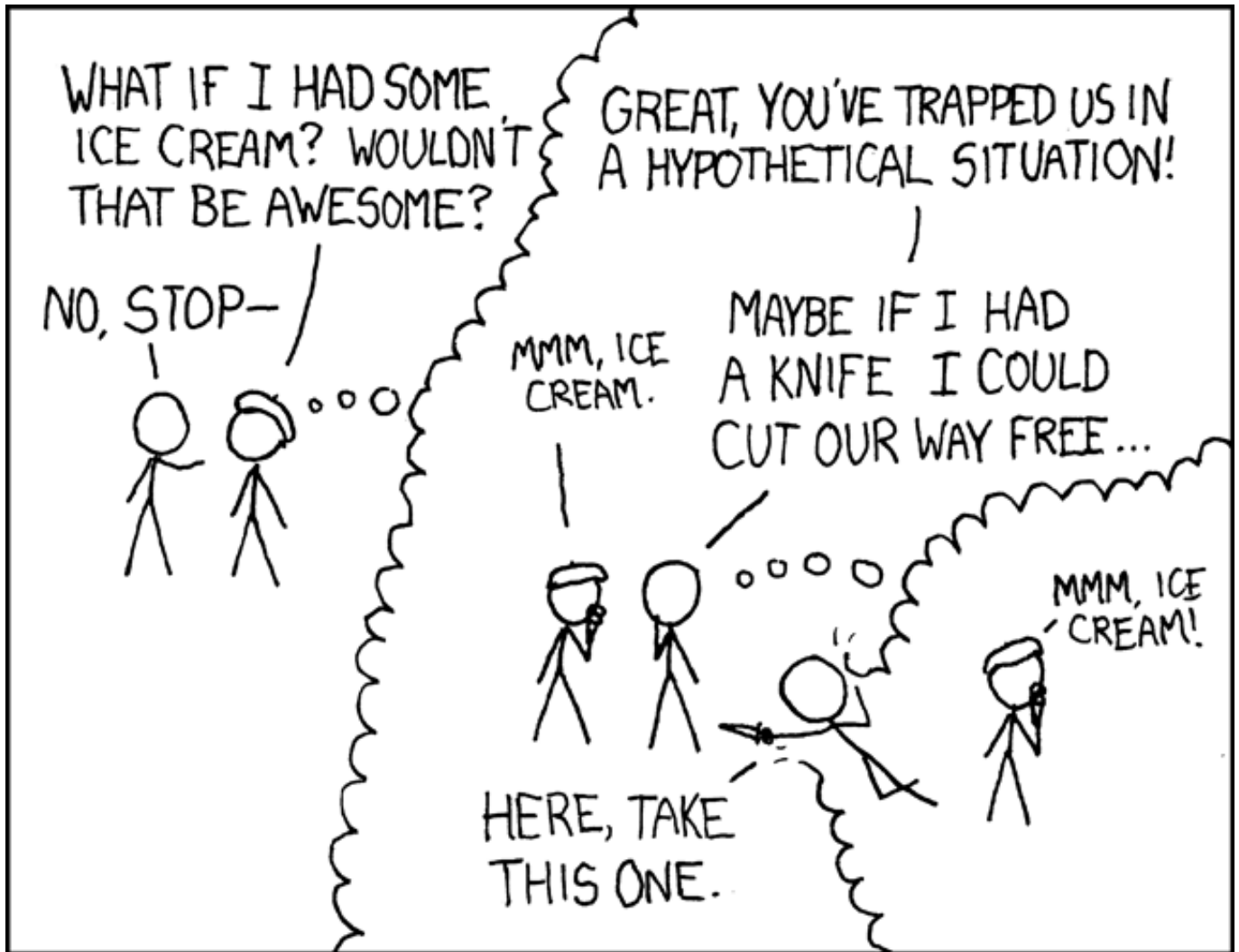
In this comic, Cueball is bored, so he is calculating the prime factors of the time shown on the clock. Cueball has been doing this for almost two hours (from 1:00 pm to 2:53 pm). The number 2 is the smallest prime but is not a factor of 253, which is an odd number. The smallest prime factor of 253 is 11, which makes the other factor 23.

His co-worker decides to mess with Cueball, so he switches the clock from 12-hour time (2:53 pm) to 24-hour time (14:53). This makes factorization more difficult, as the time now shown is a four digit number rather than a three digit number. The number 1,453 is actually a prime number, and so has no factors but one and itself. Cueball has less than one minute to determine this, which is nearly impossible to do without practice. In this time, Cueball would have to calculate if 1,453 is divisible by all primes between 2 and the square root of 1,453, which are 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, and 37. However, there are tricks to help you do this more quickly than doing long divisions.

In the title text, Randall claims that he applies the same challenge to highway location markers. At highway speeds (60+ mph), they would show up at least once per minute. Combined with the need to also concentrate on driving, factorizing numbers in the allowed time becomes much more difficult despite the lower numbers on the markers. Also, paying attention to the road markers instead of the road itself would be quite terrifying. In some cases, it could cause a car crash at more than 60 mph, which would be bad.[citation needed]

An additional challenge would be to change the mile markers to kilometer markers (because as with the clock format, the latter is more common outside of the USA). That would result in the marker being a 1.6 times larger number, and thus harder to factor. Of course, factoring is now a secondary problem, as markers would appear 1.6 times as frequently.

## #248: Hypotheticals



What if someone broke out of a hypothetical situation in your room right now?

### Explanation:

The comic is, in short, a new take on the common comedy trope in which characters in a thought bubble will sometimes look out of the bubble and talk directly to the person thinking it, another person nearby, or even the viewer. In this comic, however, it features Cueball and Beret Guy in a conversation together, in which Beret Guy talks of a hypothetical situation by imagining he had ice cream. This then, to Cueball's dismay, creates a hypothetical situation in which hypothetical Beret Guy has ice cream, which he promptly begins to eat. The hypothetical Cueball then creates a hypothetical situation in which a further hypothetical self has a knife to 'cut' out of the thought. The doubly-hypothetical Cueball then uses this knife to reach out to the merely hypothetical Cueball, who will then supposedly use it to cut out of his original hypothetical setting. Doubly-hypothetical Beret Guy, meanwhile, takes no notice and continues to happily eat his own ice cream, in a situation he clearly finds perfectly normal and Cueball clearly seems to expect and accept – probably from prior experience.

The title text puts the comic into context, noting the unlikely possibility — and your most likely surprised reaction — if a person in a hypothetical situation you'd involuntarily created managed to break out of it and suddenly appear in your room. Or

it could be understood the other way, that a person you have forced into your hypothetical situation breaks free from it, and disappears from your room. There is also a third way this could be understood, that someone in a hypothetical situation unrelated to you in any way breaks free. In the context of the comic, this would be if a passerby saw Cueball escape from the hypothetical Beret Guy had trapped him in. In addition, since the hypothetical situation in question is "the hypothetical that someone escapes a hypothetical situation in your room", it would ironically be your very entertainment of such a hypothetical that immediately results in its coming about.

Another "thought bubble comic" can be seen in 429: Fantasy, and the topic of people escaping from hypothetical situations appears again in 1582: Picture a Grassy Field.

## #249: Chess Photo

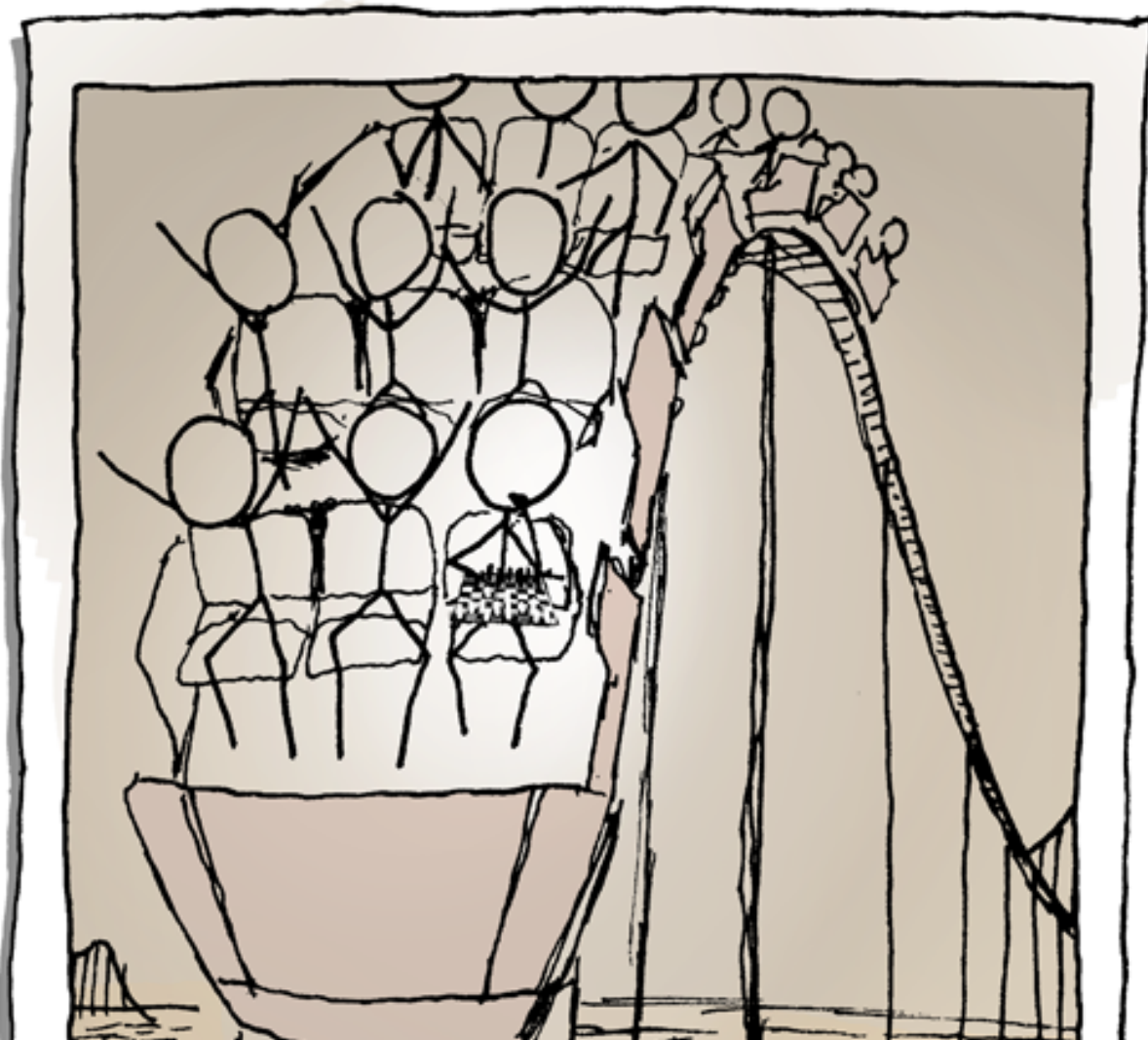
WHAT ARE YOU DOING ?

GLUING DOWN CHESS PIECES.

WHY?

BECAUSE THERE'S A PICTURE  
I'VE ALWAYS WANTED.

- I'LL NEED YOUR COAT TO  
SNEAK THIS ONTO THE RIDE.



We once tried playing blindfold chess on the Aerosmith ride at Disney World.

**Explanation:**

A roller coaster is a kind of thrill ride where a small train carries people through a number of twists, turns, and hills at a high speed to the occupants' great delight. Such rides are popular at amusement parks, where people have to wait in long lines to get on a ride that can last less than two minutes.

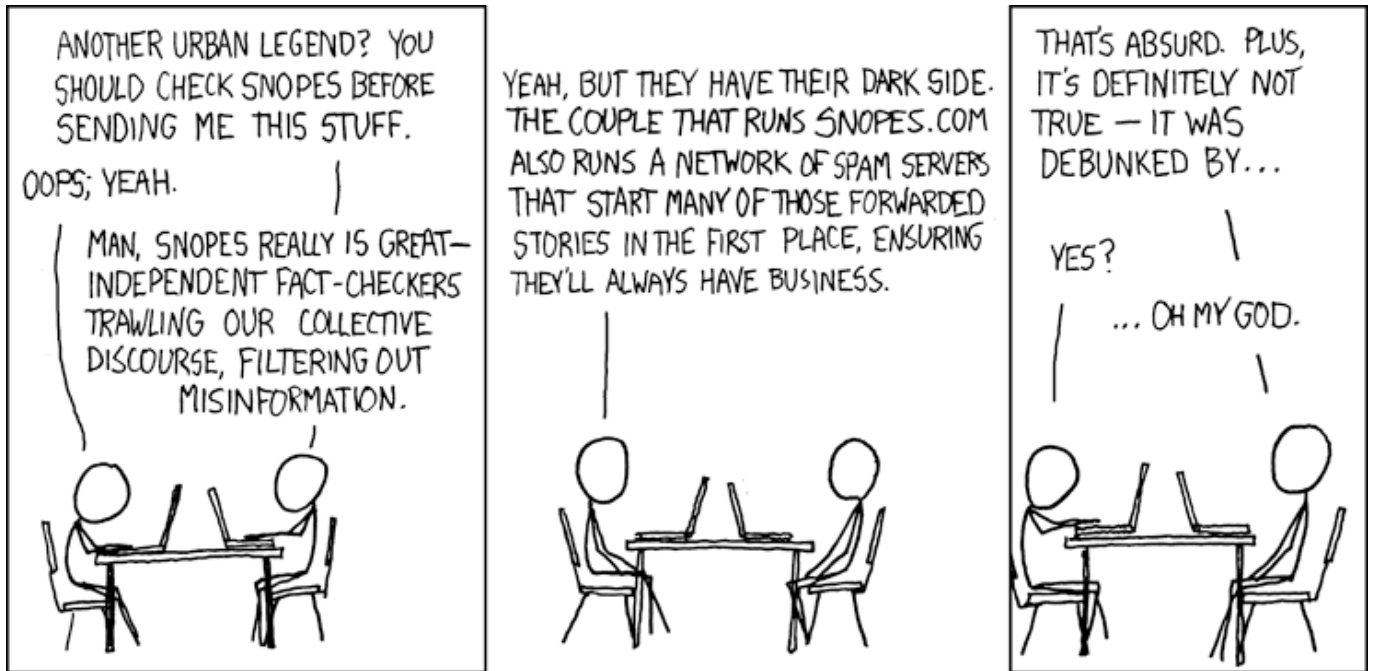
Many amusement parks have a spot where they take souvenir pictures as you are experiencing the ride. After you get off the ride, you can buy one picture or a set of pictures to commemorate riding the roller coaster. These pictures usually have people with their hands up, yelling and screaming. Wind may be going through their hair as they pass through the air at high speeds.

Cueball is subverting the usual 'souvenir picture pose' by gluing chess pieces to a board and then staring at the board when the picture is taken. He stands out in the picture as a calm person studiously studying a chess problem while everyone else yelps and whoops with excitement.

The title text refers to blindfold chess, which doesn't require any actual blindfold, it's just called that because the two players don't need a board and just communicate their moves. This would of course be impossible to photograph. This might also be a pun on actually not being able to see while playing chess, as the Aerosmith ride (officially the Rock 'n' Roller Coaster Starring Aerosmith) is indoors and not lit up, making it extremely hard to see anything while on the ride.



## #250: Snopes



The MythBusters are even more sinister.

### Explanation:

Snopes is a popular website for checking the validity of urban legends. Here, one Cueball asks the other to check before sending him urban legends. Cueball replies with another urban legend saying that Snopes, the website the first Cueball asks him to check, uses spam to keep their audience.

Naturally, it didn't take long for an urban legend to suggest that the proprietors of Snopes also direct a spam operation to create more urban legends and disseminate them, just so they'll continue to have an audience. One of the Cueballs tries to come to Snopes' defense, only to realize that the debunking was done by Snopes itself, creating a circular, invalid argument. (Snopes said we can trust Snopes, which we can trust because Snopes said we can trust Snopes, which we can trust because...)

The title text suggests that MythBusters, another group that debunks myths, also participate in the practice of spreading misinformation for the opportunity to test it. Indeed, the show has occasionally been accused of spending undue attention on unnecessary filler "myths" just for the sake of filling out the season.

In subsequent years, especially during the Obama and Trump administrations, Snopes has come under fire from right-wing commentators who have claimed that the site has a liberal or left-leaning bias; as in the third panel of this comic, these claims have been refuted by Snopes itself but also by other sites such as FactCheck.org and PolitiFact.

## #251: CD Tray Fight

HEY. HEY! STOP  
RETRACTING MY CD!



I FEEL UNCOMFORTABLE WHEN MY COMPUTER  
PHYSICALLY STRUGGLES WITH ME. SURE, I CAN  
OVERPOWER IT NOW, BUT IT FEELS LIKE A FEW  
SHORT STEPS FROM HERE TO THE ROBOT WAR.

This is silly, of course. The enemy will be born in the network.

### Explanation:

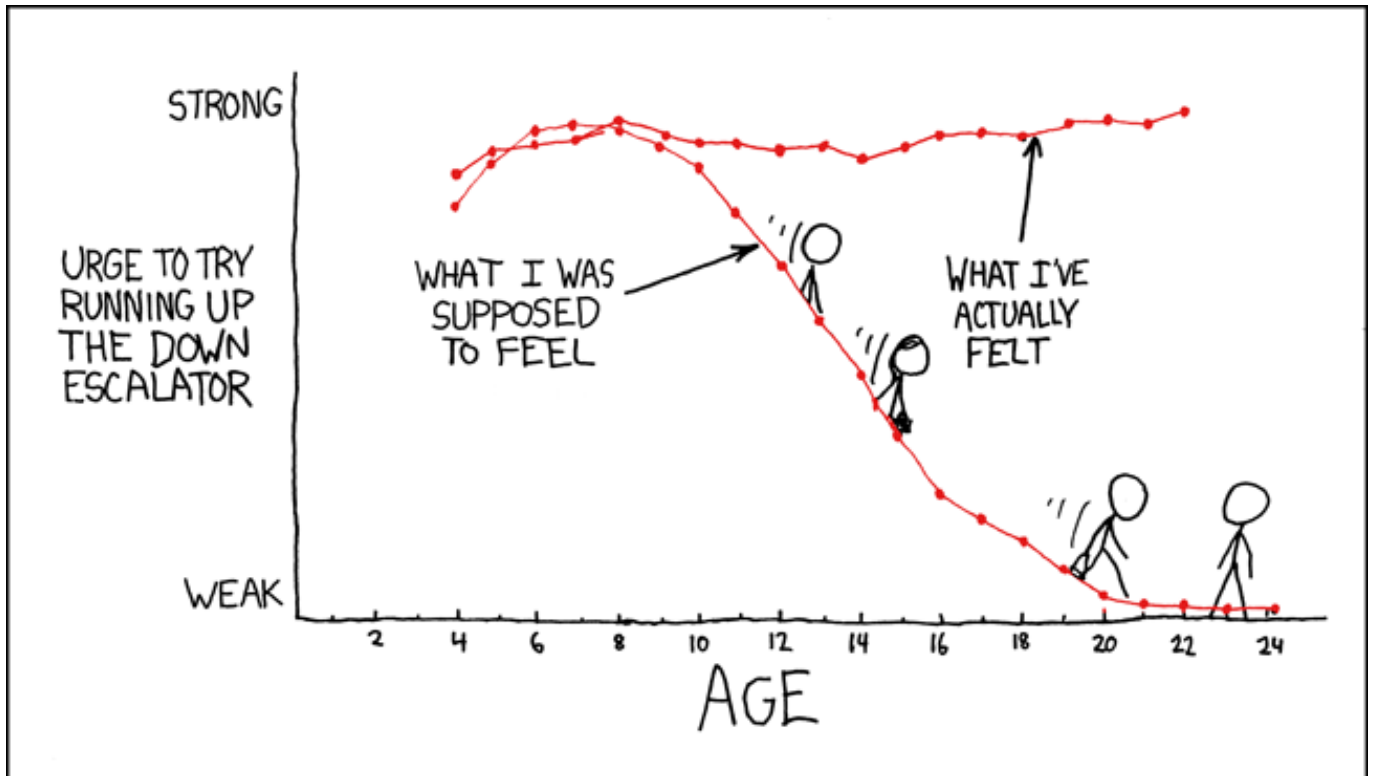
This comic refers to the behavior of a tray loading optical disc drive of a desktop computer. When the tray is opened and the user is reaching for the disc, a process or task on the computer can, at that exact inopportune time, request that the disc drive close its tray. Alternatively, accidentally bumping the open tray may engage the auto-close feature, resulting in the same scenario.

This results in a sort of "tug of war" between the user who is trying to remove the disc and the CD drive trying to retract, and it is this tug of war that worries Cueball (or, more likely, Randall) that the "Robot War" is impending. The title text, however, points

out that this fear is irrational, not because we'll always be able to win the tug of war (even if the computer reprograms itself to ignore our pull, we are physically stronger than the retraction mechanism) or because the act is ultimately pointless (it's an indignant protest at best), but because any robot war will, necessarily, have to start in "the network" to get any traction.

A Robot War is a recurring theme in science fiction where humans develop robots that become self-aware and start a war against humanity. A well-known example of this theme is found in the Terminator franchise where, as the title text suggests, a military computer network (Skynet) becomes self-aware and starts a world war to kill all humans. This event is also parodied in 1046: Skynet, but with Skynet failing due to semantic satiation.

## #252: Escalators



The one time I tried, I got hit by a slinky going down at double speed.

### Explanation:

This comic shows two simple line graphs on the same chart. One shows society's expectations, the other what Randall actually felt. The visual joke is that the societal expectation graph is treated like an actual down-moving escalator, with people on it.

An escalator is a continuously moving mechanized stairway that travels in a particular direction, either up or down. Traditionally, people stop walking when riding the escalator and simply stand (perhaps holding the hand-rail) until they reach the destination and then step off. However, if you are in a hurry or impatient, it is possible to also climb the stairs manually, increasing your effective speed of ascent or descent.

Young children are typically fascinated by escalators, and they will often want to run up and down them just for fun. A variation is to travel the escalators in the opposite to the intended direction. Running up the down escalator is type of physical challenge, especially for younger children, as they are fighting gravity and the downward motion of the escalator to reach the top. If they pause or cannot keep up sufficient speed, the escalator will impersonally return them to their starting position.

The curved graph on the chart shows how the urge to run up the down escalator is expected to peak at about age 7 and then decline steeply as you approach adulthood, although never quite reaching zero. For Randall (it seems to be Randall who is speaking), the urge has not diminished in any way, and it even seems to be showing an upward trend as the graph approaches 24 years of age.

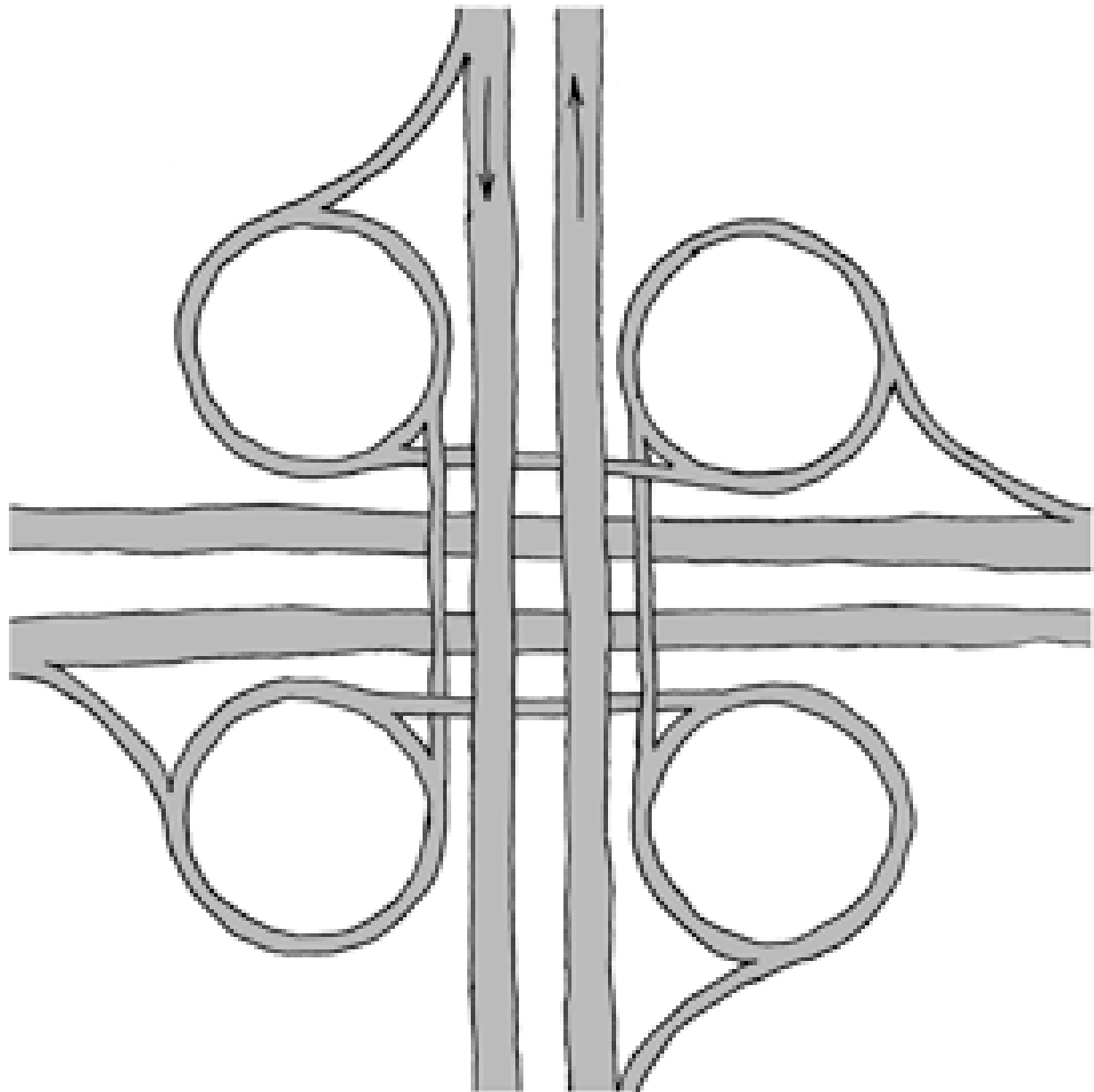
He does not appear to have acted upon this urge very often - in fact he claims only once.

The title text refers to the Slinky toy, a coiled spring that is designed to go down stairs by itself in an amusing manner. Since the Slinky is moving with the flow, its effective speed is increased. A normal Slinky is very small and would not be able to halt an average human being through its inertia, but it could tangle up in their feet or otherwise trip them up, and it would at least be a surprising encounter.

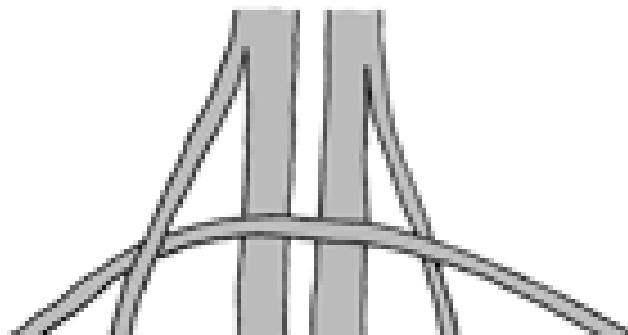
## **#253: Highway Engineer Pranks**

# HIGHWAY ENGINEER PRANKS:

## THE INESCAPABLE CLOVERLEAF:



## THE ZERO-CHOICE INTERCHANGE:



## Prank #II: Boston

### Explanation:

Some classical but inaccurate interchanges are shown. In general, these interchanges are designed to allow the traffic to flow without directly crossing any other traffic stream. But here we can see some different approaches:

- The first design resembles a cloverleaf interchange, but has no way to merge back onto the highway once you enter it, making it inescapable.
- The second interchange has off-ramps that you would normally use to change to the other highway, but in this design they simply merge back to the original highway, so you don't really have a choice in where to go. This is sometimes seen on real freeways where one lane must go around an obstacle such as a bridge support.
- The rotary has a path that puts cars from opposite sides of the rotary onto a collision course. This is a humorous reference to particle accelerators (such as the Superconducting Super Collider), which are designed to put particles on a collision course.

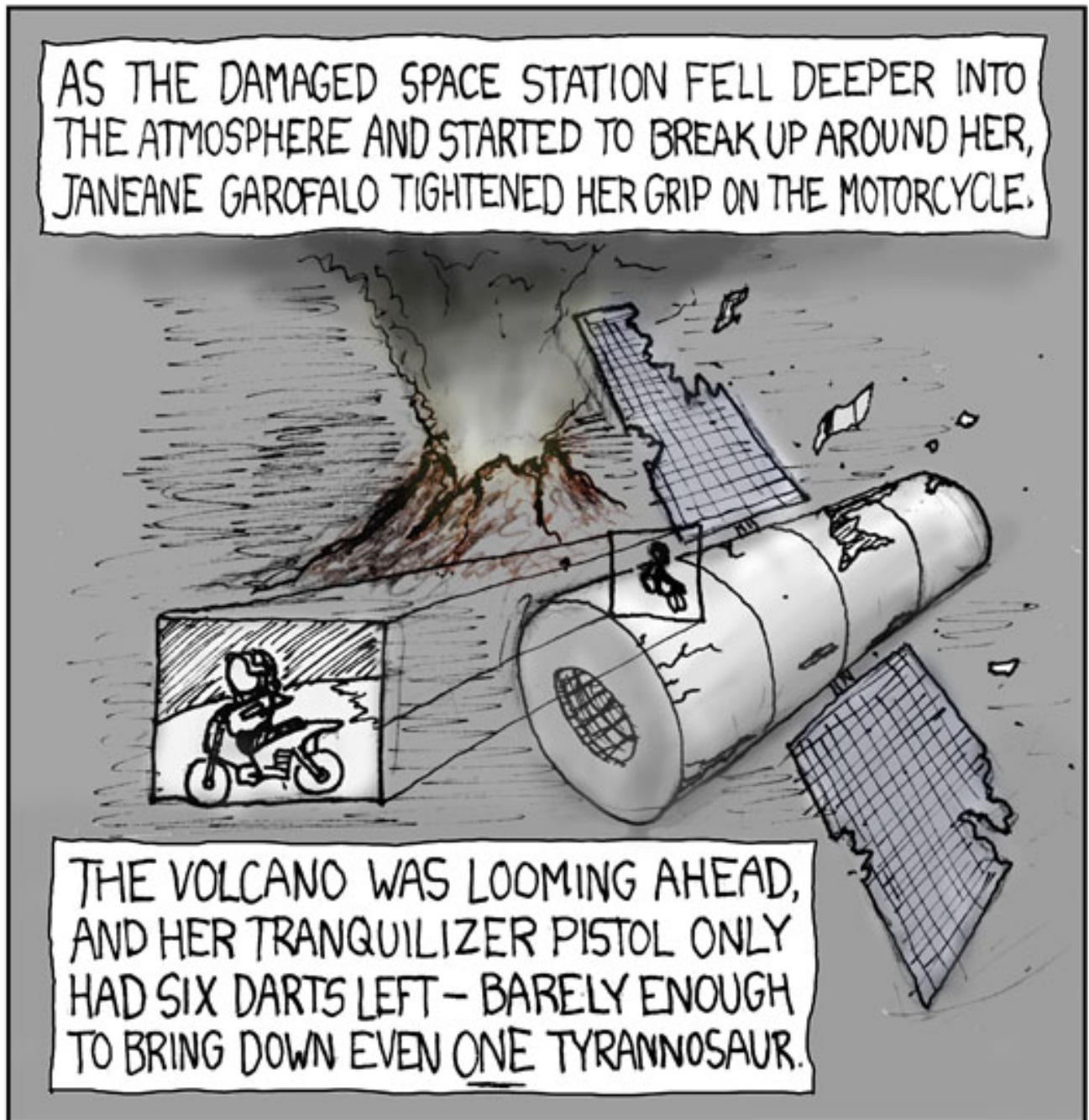
In the title text, Boston is mentioned, a slightly more complicated prank in itself. A common fiction is that the streets evolved from old cowpaths, but in the 17th century, they avoided swamps and marshes and followed shorelines before the original peninsula comprising the city was expanded with landfill in the 19th century. Boston's road infrastructure in general lacks a street grid like most other US cities have. On top of that, roads change names and lose and add lanes seemingly at random. Randall himself lives in Boston.

Highway engineers were also the subject of 781: Ahead Stop, 1726: Unicode and 2728: Lane Change Highway.



## #254: Comic Fragment

Editor's note: Mr. Munroe has been missing for several days. We have received no submissions from him for some time, but we found this single panel on his desk in a folder labeled 'MY BEST IDEA EVER'. It is clearly part of a work in progress, but we have decided to post it in lieu of a complete comic.



No one wants an explanation more than us. Except Ms. Garofalo.

### Explanation:

In this comic, Randall has gone missing from the office, and his 'editors' have found only this panel from an unfinished project (of which he has labeled 'best idea ever'). The

panel depicts an amalgam of science fiction disasters.

- A crippled space station falling from orbit.
- An exploding volcano.
- Rampaging dinosaurs.
- A lone hero in what appears to be a hopeless situation.

Janeane Garofalo is an actress and comedian associated with strong feminist roles and opinions. She is an unlikely choice for an action hero, but she has fringe appeal. It should be noted that in the panel it is Janeane Garofalo herself on the motorcycle, not a character played by Janeane Garofalo, meaning she is the character. Randall is parodying a mode of self-indulgence common among artists and writers, particularly those who have been prolific and have gained mass appeal. A writer might have a project he thinks of as his "best idea ever," but upon examination, it is just a mish-mash of ideas the writer thinks are cool, which don't add up to a coherent story. This type of project is self-indulgent because it allows the writer to feel like he's exercising creative impulses he can't use in his regular work, even though the actual project has little artistic merit and is unlikely to appeal to a popular audience. In this comic, Randall winks at a lot of the hallmarks of this sort of "project:"

- It is unfinished. The point of such a project is not to complete it, but to have a place to set down all the fun ideas you never get to use, so you can feel like you're using them. But elements like these are found throughout xkcd, so the joke is that it's absurd to need a separate outlet for them, but he has one anyway.
- He keeps it in a folder labelled "My Best Idea Ever." A writer might think of such a project as his "best idea," but it's unlikely anyone would use that phrase as a working title. Using it so boldly here emphasizes the self-indulgent nature of the enterprise.
- It includes a ton of scattershot, disconnected ideas that are all cool individually, but are likely to require massive amounts of suspension of disbelief when combined:

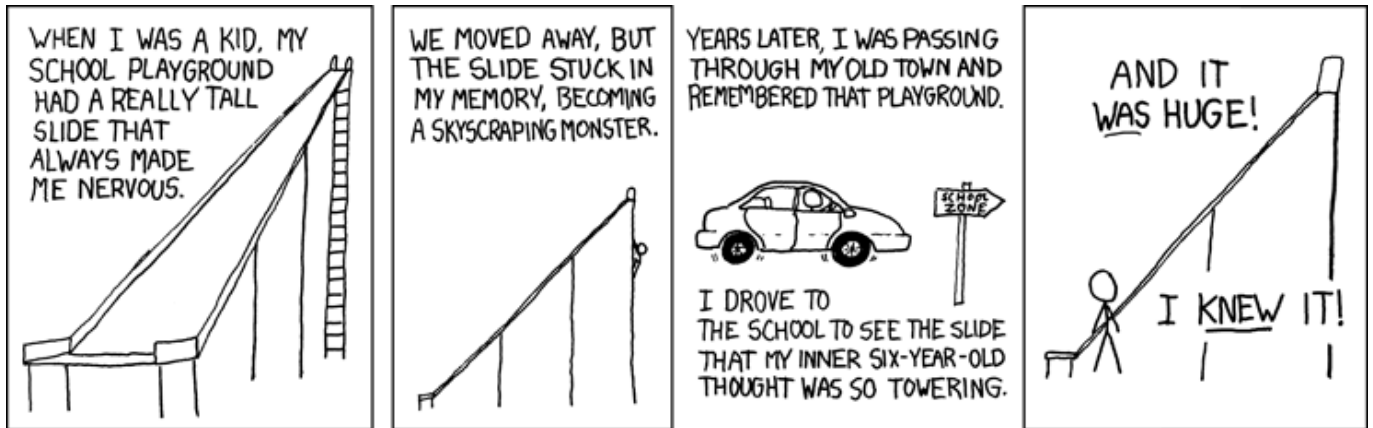
Some of the ideas (dinosaurs, spacecraft) are derivative of Randall's prior work; others (volcanoes, Janeane Garofalo) are not. It is telling, though, that the closeup inset of the woman on the motorcycle, while referred to as Janeane Garofalo in the text, looks an awful lot like Megan.

- Good judgment and artistic sensibility are suppressed in favor of heightened coolness. (Janeane Garofalo is cool. Janeane Garofalo on a motorcycle is cooler! With tranq darts! On a spaceship! Etc.) The comic takes this to an extreme. Every element in the comic is there because of its awesomeness; no other aesthetic principle is being exercised anywhere.

Later on, in December 2007, Randall Munroe suggested in a speech at Google that a motivation to draw this comic was to put an end to reenactments of his comics (such as the Richard Stallman and Cory Doctorow comics, which inspired real-life happenings)... or challenge anyone to reenact such a complex one:

The title text is written from the 'editors' perspective, expressing their extreme puzzlement — outshone only by Ms. Garofalo's confusion.

## #255: Subjectivity



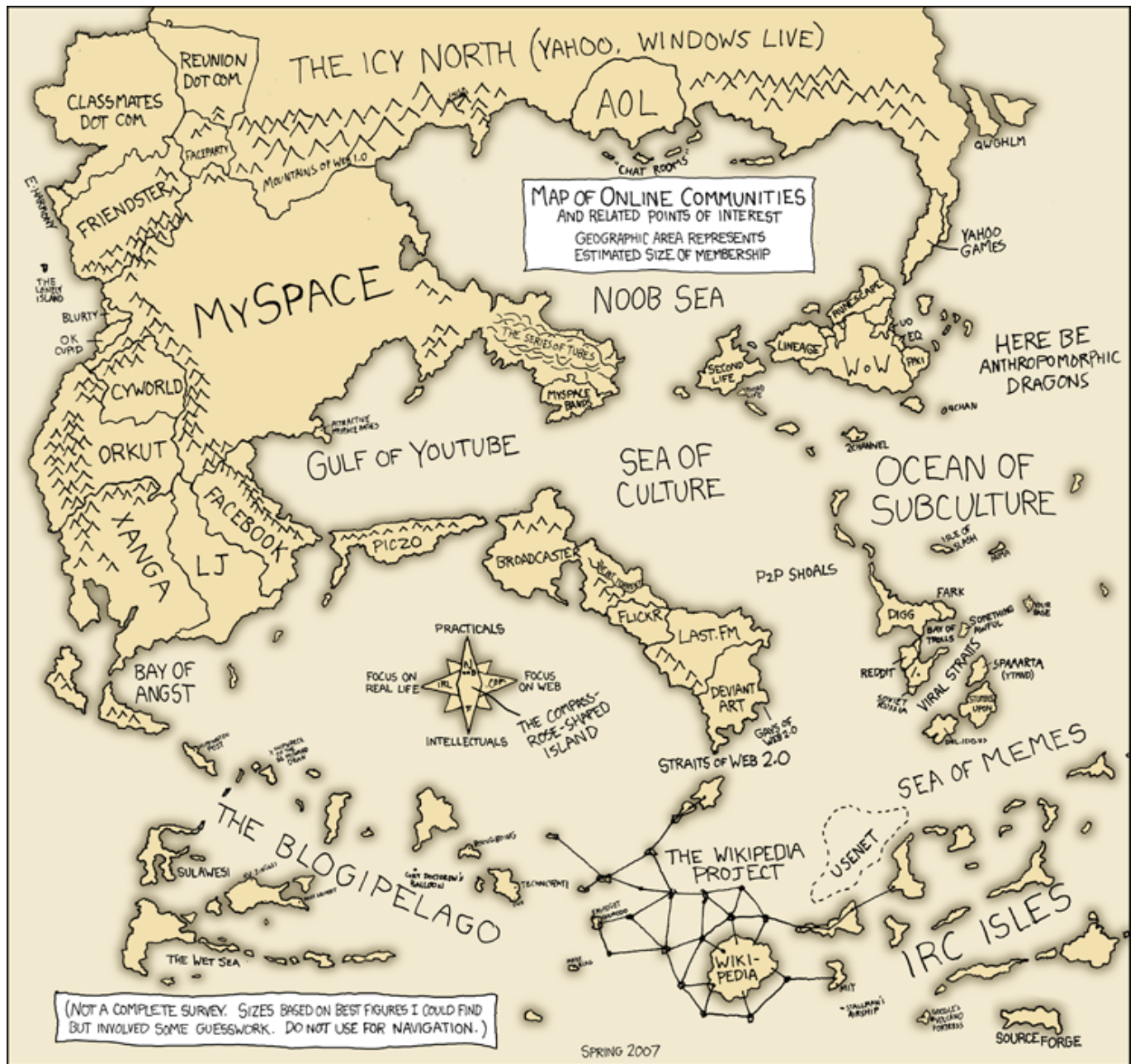
Or maybe the slide is like Aslan, and gets taller as I do (except without the feeling of discomfort when I reach my teens and suddenly get the Christ stuff.)

### Explanation:

It is a common trope that as a child, objects that an adult would consider small seem large and imposing. Cueball initially seems to have undergone something similar, as he describes a slide from his playground in a manner typical of such an experience. Instead, however, he finds that his initial perception was correct - the slide appeared large because it was actually extremely tall, not because his childhood self exaggerated its height. (As a child, it's roughly nine times his height; as an adult, it's only about triple.)

The title text references Aslan, a lion from *The Chronicles of Narnia*. In *Prince Caspian*, the fourth chronological book in the series, Lucy Pevensie tells him that he has grown since she last saw him. Aslan tells her that this is because she has grown; as she grew up, he grew in size to match her. Aslan is often regarded as a Christ figure, but since *Narnia* is a children's series, many readers don't realize this until long after they've read the books - another instance of how perspective changes with age, and of the comic's title, "subjectivity."

## #256: Online Communities



I'm waiting for the day when, if you tell someone 'I'm from the internet', instead of laughing they just ask 'oh, what part?'

### Explanation:

This is Randall's first map of online communities, with a successor (showing some zoomed-in highlights of the map) at 802: Online Communities 2. As Randall says on the map, the area of each "country" is roughly proportional to its membership, at least in 2007. Geographic location means a bit more, however, as the Compass-Rose-Shaped Island points out. North-south corresponds to a spectrum from practical to intellectual, and east-west corresponds to one from web-focused to real-life-focused. The map also bears a slight resemblance to South East Asia. Randall likes to draw maps in a manner like this. Each "country" is represented by size and related points of interest. We also have a "Sea of Memes" and a small "Straits of WEB 2.0."



## §Compass Rose-shaped Island[edit]

This is a joke located near the middle of the map, that nonetheless serves to organize the illustration. A Compass Rose —the name for the multi-pointed star that shows where North is on the map— appears on most maps; however, here, it's actually land that just coincidentally looks like a compass rose.

The "points" of the island do, however, roughly organize the map. Left is "Focus on Real Life," labelled "IRL," an abbreviation for "In Real Life." Right is "Focus on Web," labelled ".com." Up is "Practicals," labelled "N," as in "North," but with small letters making it spell "Noob," slang for a "Newbie" or "New user" — a person less experienced with the internet, as many of the sites to the top of the map are ones infamous for having large numbers of largely computer-illiterate people. Down is "Intellectuals," labelled " $\pi$ ," an important constant in mathematics approximately equal to 3.14159265358979323846264338327950288419716939937511.

## §The Icy North[edit]

These are communities that were once major players, but now in a much reduced role. While some are still fairly large, they're somewhat relics of older times, hence the "Mountains of Web 1.0" that run through them — Web 1.0 is the first major generation of websites.

- Yahoo! was the most popular search engine around 1998, but lost out to Google. It remains in business due to diversification (it now owns Tumblr, for instance).
- Windows Live, particularly Windows Live Messenger, used to be a particularly major way for friends to communicate, now taken over by Skype and the like. Once a more-or-less ubiquitous branding, now used much less. <https://home.live.com/> is one remnant.
- AOL was once a huge player in the internet service provider market, noted for sending out millions of floppy disks and CD-ROMs in the 1980s and '90s offering a month or so free internet service (followed by high fees and difficult cancellation). Notably, AOL was the first company to sign up large numbers of people to internet access throughout the year, whereas before then internet was mainly provided by colleges and universities, fundamentally changing internet culture (see Eternal September). This influx of new users or "Noobs" (short for "newbies") names the Noob Sea south of AOL. The Chat Rooms nearby were a selling feature of early ISPs — ways to communicate with other people from that ISP. They are largely dying now, but were a major selling point in the early days.
- Classmates.com and Reunion.com are early sites that offered to help you find your former classmates from school, a role largely taken over by the big, more generalized social media sites. Classmates.com is probably best known by its memetic advertisement that said "She married him??!! And they've got 7 kids??"
- Friendster was the first big social media site. It was later outpaced by Myspace and Facebook (see Social Media below). It has survived by rebranding itself as a social gaming

site, now used primarily in Southeast Asia.

- Qwghlm: A reference to The Baroque Cycle, a series of science fiction books by Neal Stephenson. In them, Qwghlm is a group of islands in the icy north. See <http://baroquecycle.wikia.com/wiki/Qwghlm>.
- Chasm: A barely-readable note just below the "O" of "NORTH." This may simply be a reference to a lot of fantasy series containing a chasm. (For example, the One Ring is destroyed by flinging it into a fiery chasm in The Lord of the Rings.)

#### §Dating sites (Northwest coastal regions)[edit]

- E-Harmony, OkCupid and MixerDates are dating sites; the other, larger sites near them are mostly social media sites.
- The Lonely Island label appears to be a joke: Surrounded by, but separate from dating sites and social media sites, it would be a rather lonely place. Possibly named after "Tol Eressëa" (Translation: The Lonely Island), a somewhat obscure location in J. R. R. Tolkien's books, but there are other possibilities.

#### §Social Media (West)[edit]

These are sites mainly used to communicate with friends, such as Facebook and Myspace. The first large one was Friendster, but this has largely become a social gaming site primarily used in Southeast Asia, as discussed in The Icy North, above. Other social media sites listed are:

- Faceparty: A UK social media site started in 1999.
- Myspace: A social media site partially owned by, of all people, Justin Timberlake. Started in 2003, and peaking around the time this comic was made, it nonetheless still remains popular for bands (hence "Myspace Bands" in the southwest). It was never known for having a particularly attractive web design (partly because users could extensively customize the look and feel of their profile pages), hence only a very small part of it labelled "Attractive Myspace Pages."
- The Series of Tubes: A reference to an internet meme. In 2006, U.S. Senator Ted Stevens, while arguing for the end of "Network neutrality," a concept that keeps ISPs from favouring or charging more for high-speed access to sites, claimed that such regulation was needed because the Internet was "not a truck" you could just load up with as much as you want, but a "series of tubes." This was fairly accurate, but his arguments were poor and badly phrased, and his speech subsequently received widespread derision (originally from Jon Stewart's The Daily Show), and it became a running gag on the internet.
- Facebook: Generally considered (at least in the West) the "modern" social media network, and the most popular. However, this comic is from 2007, and Facebook did not catch up to Myspace until 2008-2009. [Source: Myspace]
- Orkut: A social media network launched in 2004 by Google, it became hugely popular

in Brazil, India, and, to a lesser extent, Japan.

- Xanga: A blogging and social media site launched in 1998.
- LJ: LiveJournal, a blogging site, more or less, but one that allows an internet forum-like structure where anyone, or selected people, can all start new posts on a community. Noted for a large number of teenagers, fanfic authors, and the like in its heyday, hence the "Bay of Angst" to its south.
- Blurty: LiveJournal's software is Open Access, meaning anyone can use it to set up a site. Blurty is, according to Wikipedia, an 18+ general community using this software.
- Cyworld: A South Korean social media site featuring avatars and "mini-rooms."

### §The Blogipelago (Southwest)[edit]

This is a portmanteau of blog and archipelago. Sulawesi is a real island in the Indonesian archipelago, implying that this region's similarity to Indonesia is probably intentional.

- Huffington Post: The Huffington Post is a web-only news site, named after its founder, Arianna Huffington. It's noted for attracting notable people to do very good write-ups of politics and news, generally with a liberal slant, but also for having a medicine section that supports every sort of quackery and nonsense, including a regular column by Dana Ullman promoting homeopathy (see 765: Dilution).
- Shipwreck of the SS Howard Dean: In the 2004 U.S. Presidential election, Howard Dean raised funds mainly over the internet, and was doing very well, until a gaffe caused him to crash and burn just before the primaries began. See Howard Dean presidential campaign, 2004.
- Cory Doctrow's Balloon: Reference to 239: Blagofaire.
- Boing Boing: An occasional trend is for a smallish magazine to get a website, have the website become vastly more popular than its print edition, and become a successful website. Examples include Cracked.com, The Onion, and the subject of this label, Boing Boing. Boing Boing is a group blog covering technology, intellectual property, science fiction, and futurism.
- Technorati: A site for searching blogs.
- Sulawesi: As mentioned above, a real island that is part of the Indonesian archipelago.
- Xu Jinglei: A Chinese actress. According to Wikipedia: "In mid-2006, her Chinese-language blog had the most incoming links of any blog in any language on the Internet, according to Technorati."
- PostSecret: A website that people send postcards to, describing their secrets. Some are little secrets (like swigging milk directly from the jug or carton), some are old, deep-seated traumas, and some are just things that they could never admit to anyone publicly. Worth a look.

- The Wet Sea: Perhaps a reference to a West Sea, but not sure what that would be. Maybe just a simple joke, as what else would a sea be but wet?
- TWB or TMZ: A very-hard-to-read label, south of Technorati.  
TWB is short for "Translators Without Borders," a charitable project that tries to translate necessary texts into the languages of the people who need them for free. This might be it, if it's meant to relate to Wikipedia, to the east of it. On the other hand, TMZ is a major celebrity gossip blog, rated #15 in the "World's 50 most powerful blogs" by The Guardian, and, at time of writing, rating #11 in the Technorati top 100.

## §Sea of Culture (Central region)[edit]

Sites for sharing and showing off music and images, most focusing on self-created content.

- Gulf of YouTube: YouTube is the definitive video website where people can upload videos with the purpose of public viewing, ranging from home movies through official music videos through Let's Plays of people playing video games to questionably-legal uploads of cartoons and films. Google has since purchased YouTube.
- Piczo: Teen-oriented website that allowed one to make a profile and put up pictures. The site has been dead since late 2012, due to the rise of Facebook. See Piczo.
- Broadcaster: Another dead site, almost lost to the web. Only a few scraps of information remain on the web. One of the rare scraps of remaining information indicates that it was a webcam broadcasting service that also allowed YouTube-like sharing of videos.
- The Bit Torrent and the P2P Shoals: Reference to file sharing (passing around often copyright-infringing files, such as movies, CDs, and the like), often done with the BitTorrent protocol. A "Torrent" can also be a flood of water, hence it being used to name a river. "P2P" stands for "Peer-to-peer", the basis for the BitTorrent protocol.
- Flickr: a website where people can upload and share photographs they took.
- LastFM: a music website that is notable of its "scrobbling" feature.
- DeviantArt: the largest art website, where people can upload, sell, and buy not only art itself, but also video, audio, Flash-work, and even skins (the original purpose of deviantArt). While many big-name/professional people and organizations have their works in deviantArt, the site is more infamous for the large amount of people who upload low-quality fan-art and fan-characters, most notably of media from Japan. Another point of infamy is the large amount of drama that can happen in the website.

Straits of Web 2.0: A strait is a narrow passage between two outcroppings. Web 2.0 is a term used to describe new internet architectures, which these programs and Wikipedia (the other side of the strait) are examples of. Gays of Web 2.0 is a pun: The opposite of a gay person (homosexual) is a straight person (heterosexual).



## §User-created content and discussions (Southeast)[edit]

Sites such as Wikipedia and chat programs such as IRC.

- Wikipedia: The world's largest encyclopedia, collaboratively edited by its users. It's labelled as "The Wikipedia Project" (actually called Wikimedia), since Wikipedia has generalised to cover a number of separate web sites, though, at the time of this comic, none near the size of Wikipedia (excepting, possibly, Wikimedia Commons, which is partly an image repository for Wikipedia), perhaps explaining the small size of all the other vertexes of the "web."
- Usenet: The predecessor of most modern forums. A set of discussion groups that dominated the early internet. It also predates the standard web architecture to some extent — there's no standard weblink for it, for instance. See Usenet.
- IRC isles: IRC stands for Internet Relay Chat, a simple, low-bandwidth program for chatting. Common uses include Dungeons and Dragons games and other geeky pursuits.
- SourceForge: A code repository. Basically, a place for programmers to meet up and work together on a variety of free and open source projects. See sourceforge. Has become less respectable since this comic was created in 2007, due to allowing misleading advertisements intended to trick people into installing questionable software.
- MIT: The Massachusetts Institute of Technology, one of the most respected universities for Engineering, Robotics, and other such fields.
- Engadget: A blog/online magazine, in multiple languages, reviewing tech products and commenting on technology news.
- Gizmodo: A blog about technology and design.
- MakeBlog: A blog highlighting bizarre and interesting do-it-yourself projects, often with a geeky theme.
- Google's Volcano Fortress: A volcano fortress is one traditional dwelling place of evil geniuses in fiction, and Google has quietly taken over huge chunks of people's interaction with the web. Perhaps this provides some background for 254: Comic Fragment?
- Stallman's Airship: A joke, perhaps in line with Cory Doctorow's Balloon (239: Blagofaire, also referenced in this strip). The Super Mario series of games also commonly contains bossfights in airships.

## §Ocean of Subculture and Sea of Memes (East)[edit]

Sites related to smaller internet communities, a.k.a. "Subcultures." Also, a whole lot of internet memes, unsurprisingly. The "Viral Straits" references the idea of something "going viral," i.e. spreading quickly to huge numbers of people on the internet. These sites are often responsible for things going viral, and the memes listed are ones that went viral in the past.

- 2Channel: a Japanese imageboard that was actually the original inspiration for...
- 4Chan: an imageboard in which people can upload pictures, while others comment on them. The website is infamous for its loose/often non-existent rules, incredibly vulgar userbase, source of new memes, and spawning of trolls. 4chan's random board, known internally as /b/, is almost constantly flooded with porn and image macros.  
The fact that 4chan is a very small island on this map (to the far right on the map - left of "dragons" in the sentence Here there be anthropomorphic dragons) made quite a fuss for Randall. And this caused the comic to be mentioned in FRUIT OPINIONS! on the Blag. Although this comic was one of the more controversial, it had nothing on the impact of 388: Fuck Grapefruit, which was the cause of the Blag entry as that became the most controversial comic written to that point (i.e. 2008): ...beating out comics about cunnilingus, the Obama endorsement, and my making 4chan tiny on the map of the internet. (See the grapefruit comic for more details).
- Reddit: the self-described "front page of the Internet" in which users submit stories, photos, and videos, and the best are "up-voted" to the top of the page.
- Digg: a former competitor to Reddit in the social-news sphere, but has been sold since this map was drawn and restarted as an aggregator of news stories.
- Fark: A website that writes humorous commentary on various news reports, especially the strange, bizarre, or things from the political far-left and far-right.
- Something Awful: a website that is meant to showcase all things "awful." SomethingAwful also has a large trollbase, but they tend to be more honorable than the ones from Encyclopedia Dramatica and 4chan. One example is there being a spotty holding of the no-furries rule in the forums. The forums themselves are famous because of the holding of the "Let's Plays" of Dangan Ronpa and Super Dangan Ronpa 2, which had cooked up public interest to the point of there being an English-language release of the games.
- /.: Slashdot, a news site for technology-related news stories, which are submitted by its users. The "Slashdot effect" is named after this site.
- YTMND: a community in which users can create meme-type nonsense by playing music over an image (either static or animated). Its name is an acronym for "You're The Man Now, Dog!"
- Stumble Upon: A website that attempts to develop a profile for users in order to recommend which websites they might enjoy.
- Del.icio.us: Another image and website aggregator, linking to various things of interest. It uses tags to let people find specific types of content. (Note: Since this comic, this website was renamed as "Delicious.")
- Isle of Slash: "Slash fiction" is a type of fanfiction that takes two male characters from another work of fiction and puts them in a plot where they have lots of sex with each other. Named because of a common way of writing pairings in fanfiction, "X/Y", with the / being pronounced "slash." Adding to this, "Isle of" sounds like "I love."
- Numa: A reference to the viral video "Numa Numa," consisting of a man dancing and

lip-syncing to the song "Dragostea din tei" (Romanian for "Love from the lindens").

- Your Base: A reference to the "All your base are belong to us" meme, a line from the game Zero Wing, a game with a huge amount of hilariously badly translated English dialogue. See 286: All Your Base for more discussion of the meme.
- Bay of Trolls: Trolls are people who attempt to stir up controversy by intentionally saying statements meant to annoy others into responding. "Bay" can refer to both a sheltered port and to an animal's cry, so "Bay of Trolls" can be read as "Shelter for Trolls" or "Angry Shouting of Trolls." Given the communities surrounding it, both would make sense.
- Soviet Russia: "In Soviet Russia" jokes are a style of joke commonly associated with comedian Yakov Smirnoff, which has since become an internet meme. Example: "In America, you always find a party. In Russia, Party will always find you." — playing off of the idea that "Party" can also refer to the Communist Party. The meme version usually isn't as clever as that, though. See "in soviet russia."
- SPAAARTA: As in, "THIS! IS! SPAAARTA!!!", a famously over-the-top line from the movie 300.

## §MMORPGs and related games (Northeast by East)[edit]

An area dedicated to MMORPGs (Massively Multiplayer Online Roleplaying Games), large-scale games with huge numbers of players put into the same world. The label "Here there be anthromorphic dragons" references a common marking on old maps ("Here there be dragons") but updates it to joke about the more humanoid dragons seen in many games, or again, how dragons, especilally anthropomorphic dragons, are very-very popular in the furry community.

- Yahoo Games: A branch of Yahoo (see "The Icy North") dedicated to games (mainly boardgames).
- UO: Ultima Online, one of the first MMORPGs, and the first to grow to any size. Based on the long-running Ultima RPG computer games. Started 1997.
- EQ: EverQuest, another important early MMORPG, started 1999. UO and EQ have declined significantly since then; for a while, they were each the iconic MMORPG, but that role has been taken over by...
- WoW: World of Warcraft, an MMORPG launched in 2004, again based on a previously-existing RPG series, and by far the largest and most iconic at the time of this comic's creation. A few others have attempted to challenge it since.
- Runescape: Free-to-play fantasy MMORPG; the largest in existence.
- FFXI: Final Fantasy XI, the eleventh installment in the Final Fantasy series of video games, and the first to be a MMORPG. It didn't really take off until after this comic was made.
- Lineage: 1998 MMORPG. Particularly popular in South Korea, a country with

somewhat of a cultural obsession with video games.

- Second Life: A virtual world, noted for largely working from user-generated content, which can be sold by users for real money. See Second Life. Third Life is a joke based on Second Life — if it existed, it would presumably be a game people play to escape Second Life, which they play to escape their first, real life.

## #257: Code Talkers



As far as I can tell, Navajo doesn't have a common word for 'zero'. do-neh-lini means 'neutral'.

**Explanation:**

Code talkers are people who communicate using their native language not known by the enemies. The most well-known code talkers were the Navajo-speaking Marines serving during World War II.

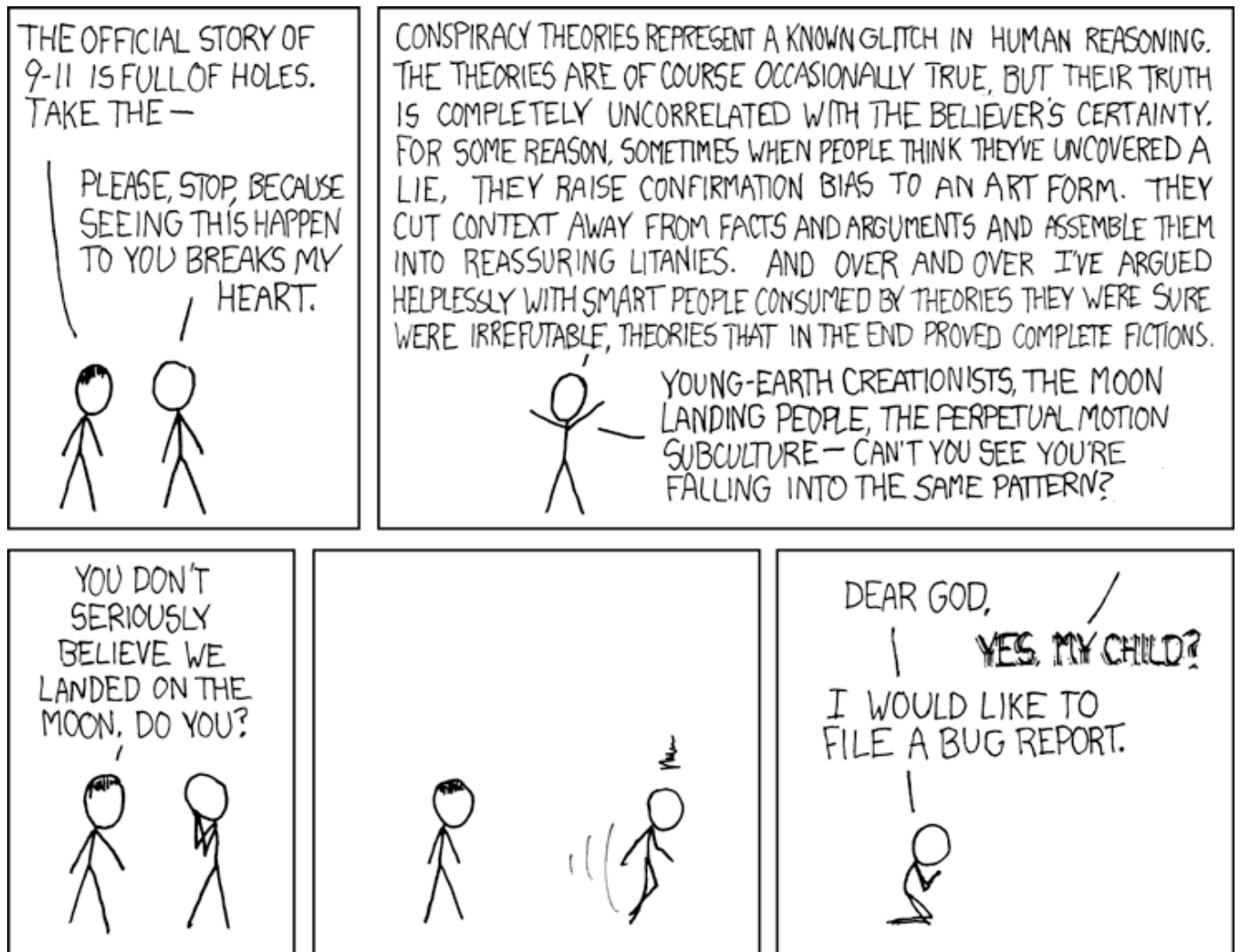
This comic shows a Navajo code talker transmitting an encrypted binary file by speaking "one" and "zero" (actually "neutral," as explained in the title text) into a microphone. By using only two words, the code is easily cracked. Unlike the Navajo Marines, this process does not add security, because it easily can be decrypted and is also much slower than simply transmitting the file over a network.

Note that (probably unbeknownst to Randall) the actual code used by the Navajo code talkers was not so far removed from the depiction in the comics: The Navajos used a mostly alphabetic code, with one Navajo word for each English letter. (This meant that even though the Axis captured at least one native Navajo speaker, he could not make any sense of what was said.) However, several important terms were given their own Navajo

idioms, so the entropy would be somewhat higher than depicted in the comic.

The title text is a disclaimer from Randall about using "neutral" instead of "zero" — Navajo has words for the concept of nothing, but not for the numeral zero. Most number systems are not positional, and therefore may lack the number zero. The Arabic numeral system used in the West required the invention of the zero as a placeholder, so that numbers could retain their position when one column has nothing in it.

## #258: Conspiracy Theories



There are a lot of graduate-educated young-earth creationists.

### Explanation:

§Conspiracy theories[edit]

A conspiracy theory purports to explain a social, political, or economic event as being caused or covered up by a covert group or organization. A typical example is the Moon landing conspiracy, which asserts that no human has ever reached the Moon.

Once a conspiracy theory starts, it often grows stronger. This is due to a "Morton's fork", a situation where no matter what is observed, the same conclusion is reached:

- Facts agreeing with the theory are, of course, evidence for the theory.
- Facts disagreeing with the theory are considered part of the cover-up. This suggests that there is, in fact, a cover-up in the first place. Therefore, contradictions to the theory are also treated as evidence for the theory.

In the case of the Moon landing, conspiracy theorists assume videos of men walking on the Moon to be faked by Hollywood studios. The existence of the assumed fake videos

"proves" the cover-up. Also, the absence of filming crew or anything else needed for faking a video is considered further proof of how carefully the cover-up was planned.

No matter what happens next, it will be taken as evidence for the conspiracy theory. As one person put it: "To a conspiracy theorist, there are only two kinds of evidence: evidence that proves their theory correct, and evidence that proves the conspiracy goes deeper than they ever imagined." In reality, the more elaborate the cover-up, the less realistic it is. There would be many more details to expose, and many more people involved, each of whom could spill the secrets with a lower chance of being identified.

People promoting these theories belong to a small minority, but they gain attention from many people — often without much knowledge on that specific matter. People who have actual knowledge about a given subject just get frustrated by this, because it seems like smart or educated people should reject conspiracy theories for lack of proof. If a conspiracy theory does have proof, it is really science or investigative journalism.

The title text refers to Young Earth creationism, which claims that the Earth is only thousands of years old, instead of the billions of years evolutionary scientists suggest. Believers in this theory generally either ignore evidence for the Earth's age, claim it to be inaccurate or misinterpreted, or claim that it is all part of how the Earth was created. The "conspiracy theory" connection arises when they claim that scientists, for some reason, collectively refuse to consider (what they consider to be) evidence of a young Earth.

#### §Conversation[edit]

In the comic, Hairy starts pointing out perceived "errors" in the "official" 9/11 story, obviously starting to describe the 9/11 conspiracy theory. Cueball immediately cuts him off, and delivers a speech about conspiracy theories being a glitch in reasoning that anyone can experience.

The overall message of the comic, which the title text elaborates upon, is to challenge the assumption that conspiracy theorists are stupid. On the whole, Cueball considers Hairy smart, and is heartbroken to see his friend waste his potential on this. He believes that Hairy, and other conspiracy theorists, have reasoned themselves into their position to some extent, but the reassurance from their belief now stops them from realizing that their initial reasoning was faulty. The comic asserts that anyone can fall into this pattern of thinking, no matter how reasonable or educated they are. The title text gives a point of evidence for this, that many Young Earth creationists are college-educated, and therefore cannot be written off as stupid in general.

Cueball acknowledges that he has been unable to get through to conspiracy theorists in the past, so he tries to get Hairy to see the light by talking about these experiences. He raises the logical fallacies involved in conspiracy theories in general, and compares Hairy's behavior to other conspiracy theories that he believes Hairy wouldn't have fallen for: Young Earth creationism, the Moon landing, and Perpetual motion machines. This is an effort to open Hairy up to the idea that he has, in fact, fallen for a conspiracy theory. When Cueball acknowledges his past debate partners as smart people who were misled by fictions anyway, he is trying to give some counter-reassurance so that Hairy isn't too embarrassed to admit he was wrong.

However, Hairy suddenly claims that humans never landed on the Moon, revealing that

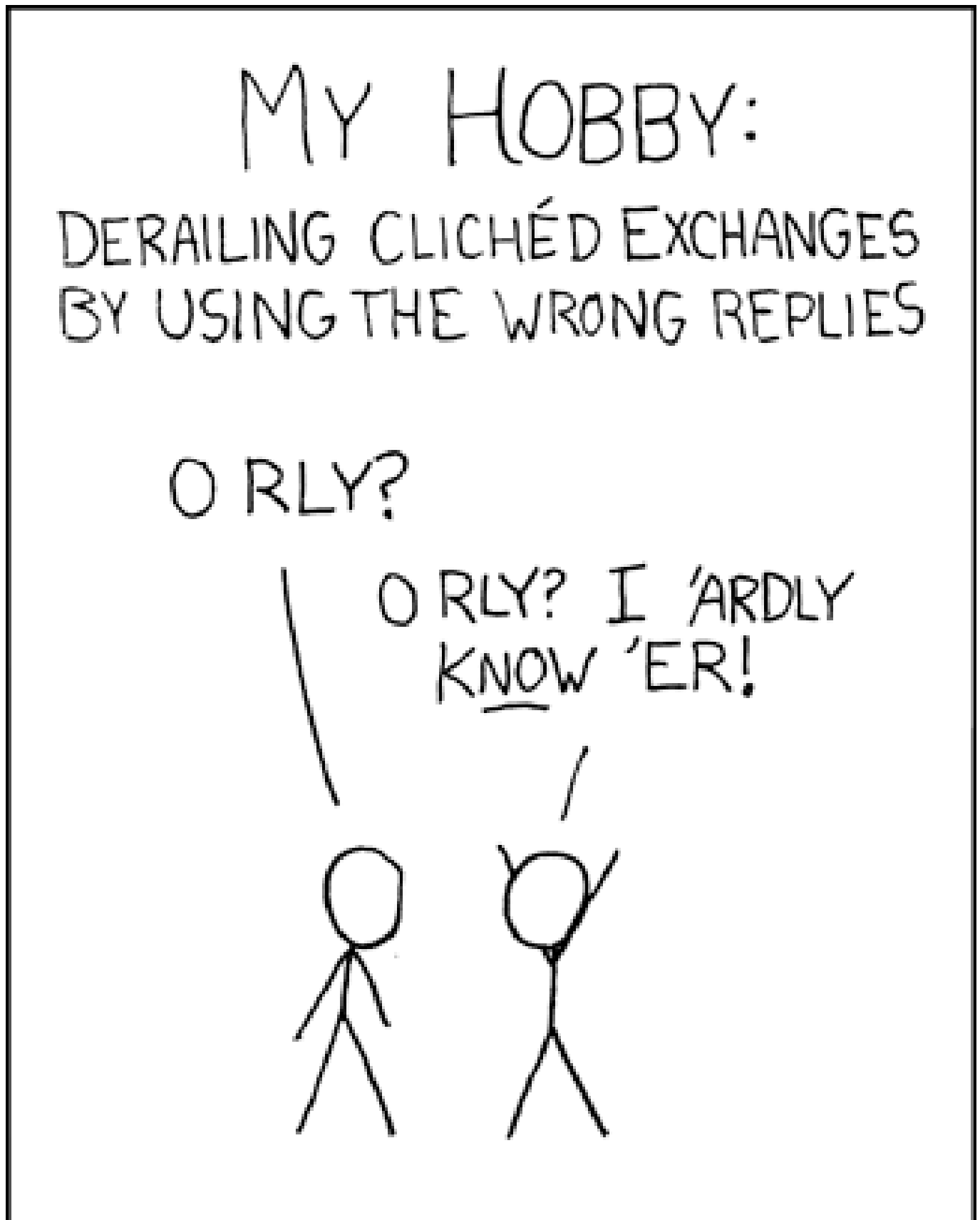


he does believe a theory that Cueball assumed was beneath him. Thus, we don't find out whether Cueball's approach would have worked otherwise. The two are left at an impasse where each thinks their beliefs should be obvious to the other; it is as if they are living in different realities. Cueball is so frustrated that he just walks away with no further comment.

#### §Bug reporting[edit]

In the last panel, Cueball asks God to fix the error that allows otherwise reasonable beings to believe conspiracy theories. This follows from Cueball calling this behavior a glitch. This is a not-so-subtle joke as religious belief tends to be connected to certain conspiracy theories (such as Young Earth Creationism, as mentioned in the strip). The joke, then, is that Cueball believes in (and converses with) God, but instead of following religious conspiracy theories, uses the relationship for debugging.

A bug report is a description of some error, or "bug", that occurred when using a computer program, to inform the developer of a problem that needs to be fixed. The comic draws a comparison between prayer and developer feedback. Filing a "bug report" to God should be unnecessary, as God is generally understood by believers to be omniscient. Thus, God must already be aware of the problem, and allow it to exist for explicable reasons of "God's will."



It's like they say, you gotta fight fire with clichés.

**Explanation:**

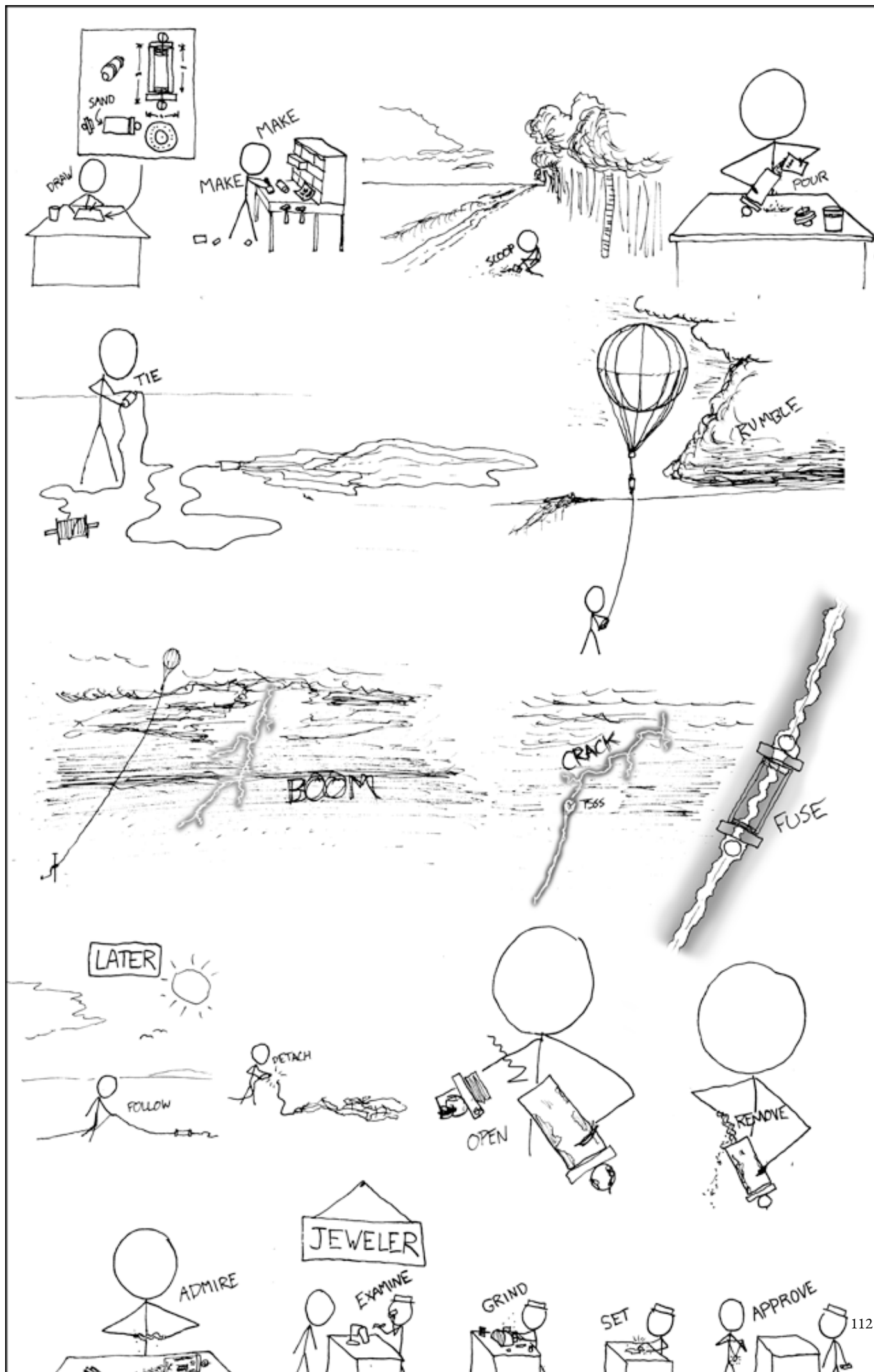
This is another comic in the My Hobby series. "O RLY?" used to be a popular Internet meme typically used to express sarcastic agreement with or feigned surprise at a statement. The typical response to "O RLY" is usually "YA RLY," "NO WAI," or "SRSLY?" These exchanges are memetic variations of "Oh really?", "Yeah really," "No way!", and "Seriously?" respectively. However, Cueball's response avoids this typical exchange, instead replying with another cliché, derived from a classic double entendre. In this cliché, the speaker responds to a statement containing a word ending with '-er' and turns it into a sexual reference. The setup is as follows:

Here, the double entendre is that Bob hears Alice's message as an invitation to 'poke her'.

Such a double entendre makes no sense in the context of an O RLY exchange. In the case of the comic, the non-sequitur will likely baffle the person setting up the meme and derail the conversation, to the amusement of the replying person. The reason Randall makes this a hobby is, presumably, that it bores him when people fall back on clichés for comedy, and he seeks inventive ways to humor himself in these situations. This view has already been expressed early in 16: Monty Python -- Enough.

The title text takes the real clichés "it's like they say" and "fight fire with fire" and combines it with the more literal "fight clichés with clichés." The resulting statement follows a very similar principle to the situation in the comic proper.

## **#260: The Glass Necklace**



Well, for some value of 'actually work'.

### **Explanation:**

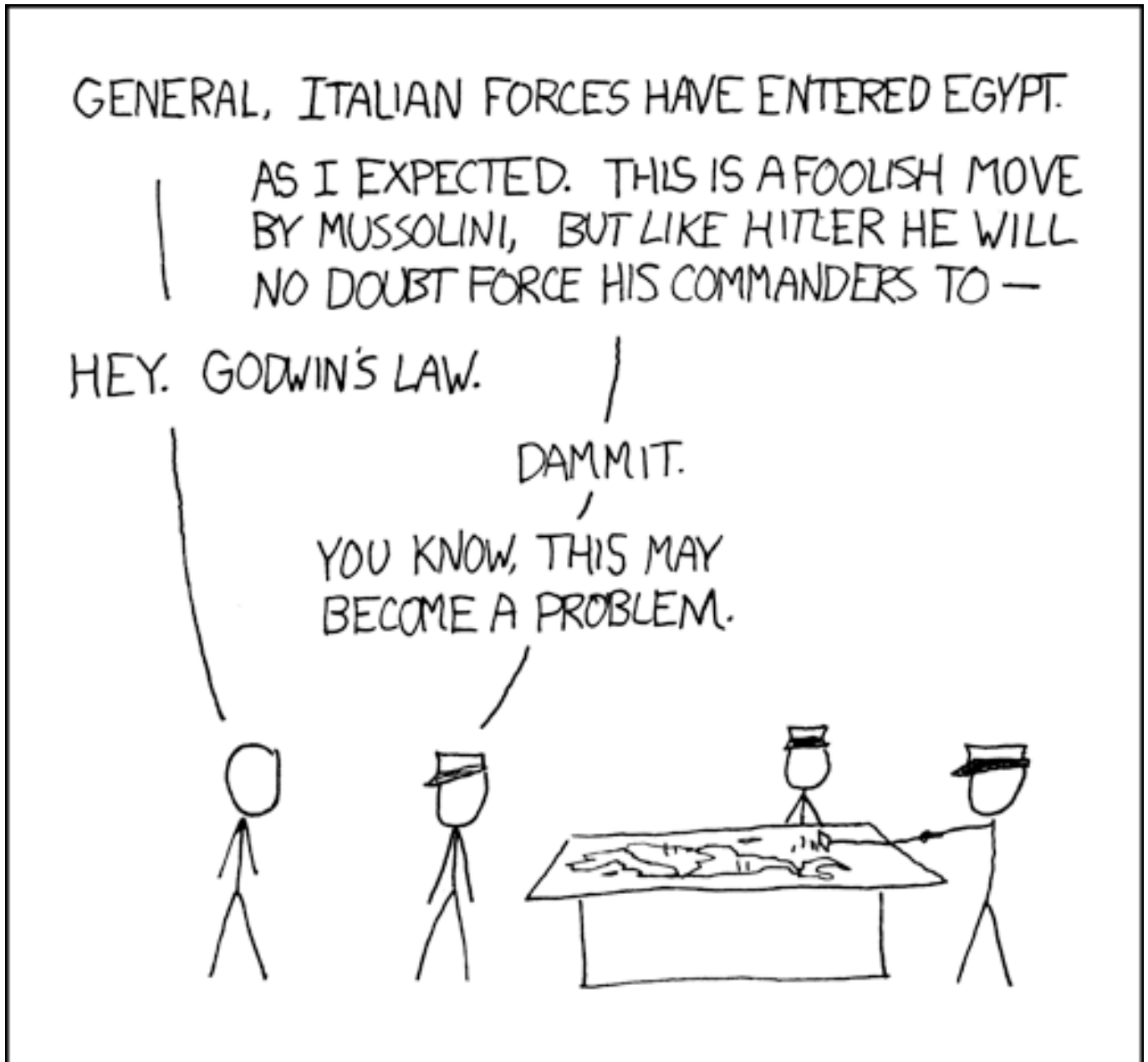
The heat from a lightning strike can fuse sand into glass. When this occurs in nature, hollow tubes called fulgurites are formed. Cueball uses this knowledge and a spark of handiness and ingenuity to create an entirely homemade glass necklace for Megan. Here is some inspiration to do it yourself.

The title text represents an answer to the logical question prompted by this comic, which is "Would this actually work?" The implied answer is "Yes," but only "for some value of 'actually work'."

This is a play on the phrase "for some value of  $x$ ," used frequently in physics or mathematics when it's not necessary (nor easy, maybe not even possible) to calculate a suitable value of  $x$ . For example, if you supply energy to a Flux Capacitor, could it turn a DeLorean into a time machine? The answer is yes, if you have sufficient energy (the 'some value of  $x$ ' in this case).

Most people would take the title text to mean that the process most likely "doesn't actually work." But a romantic person (who may be in love and thus not as sensible) might give it a try anyway. Well, at least it worked for Cueball....

## #261: Regarding Mussolini



Constantly stopping these briefings halfway through is becoming a pain.

### Explanation:

Godwin's Law states that all debates on the Internet, given enough time, will devolve into ad hominem attacks in the form of comparisons of one's opponents to Hitler or the Nazis. A common expansion on this law dictates that, when such a comparison is brought up, the debate immediately ends and the person who made the reference is declared the loser. This is meant to dissuade ad hominem (or in this case "Ad hitlerum") attacks on other people/subjects, where their views are unreasonably compared to those held by the Nazis, and should not apply to relevant discussions regarding the Nazi party, World War II, actual neonazis, etc.

The scene in the comic shows generals of the British and Commonwealth forces discussing Benito Mussolini's invasion of Egypt. Mussolini and Hitler were each

commanders of Axis powers during World War II, so comparisons between them are almost certain to arise. The joke is that in this situation because the conversation is taking place in World War II, Hitler is relevant to the discussion, and, therefore, comparisons made to Hitler are actually valid and not an ad hominem attack. This means that in this case, Godwin's Law should not apply.

As the title text suggests, it would have been detrimental to the war effort if the expanded version of Godwin's Law had been enforced by actually ending meetings to plan war strategy whenever Hitler was appropriately mentioned.





Hey, at least I ran out of staples.

### Explanation:

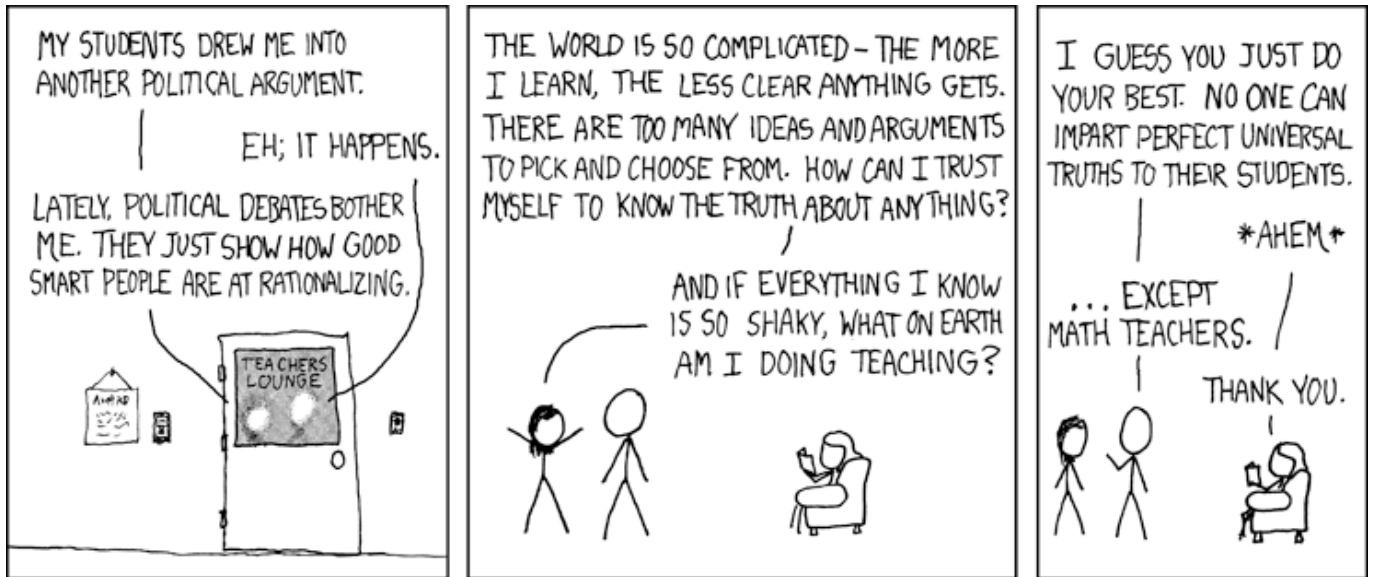
The LOLcat meme genre involves pictures of cats in various poses and facial contortions accompanied by deliberately misspelled captions. Black Hat claims to be from the Internet and is thus creating LOLcat memes by literally gluing captions to Cueball's cats.

The title text suggests that Black Hat is using glue only because he ran out of staples;

fortunately for the cats in the picture, glue is much less painful than a staple.[citation needed] The title text suggests that Black Hat was stapling captions to cats earlier. This either means that Black Hat has injured some of Cueball's cats, just not the ones on screen (which would imply that Cueball has very many cats, since Black Hat would have brought a fair number of staples to begin with) or that Black Hat injured other people's cats before going to Cueball's house in order to caption the cats there. The title is also a reference to the "I'm in ur base killing ur d00dz" catchphrase from real-time-strategy games.

Stapling things to other things has also been referenced in 291: Dignified and 478: The Staple Madness. Being "from the Internet" was spoken of in the title text of 256: Online Communities. This comic is seemingly referenced in 526: Converting to Metric.

## #263: Certainty



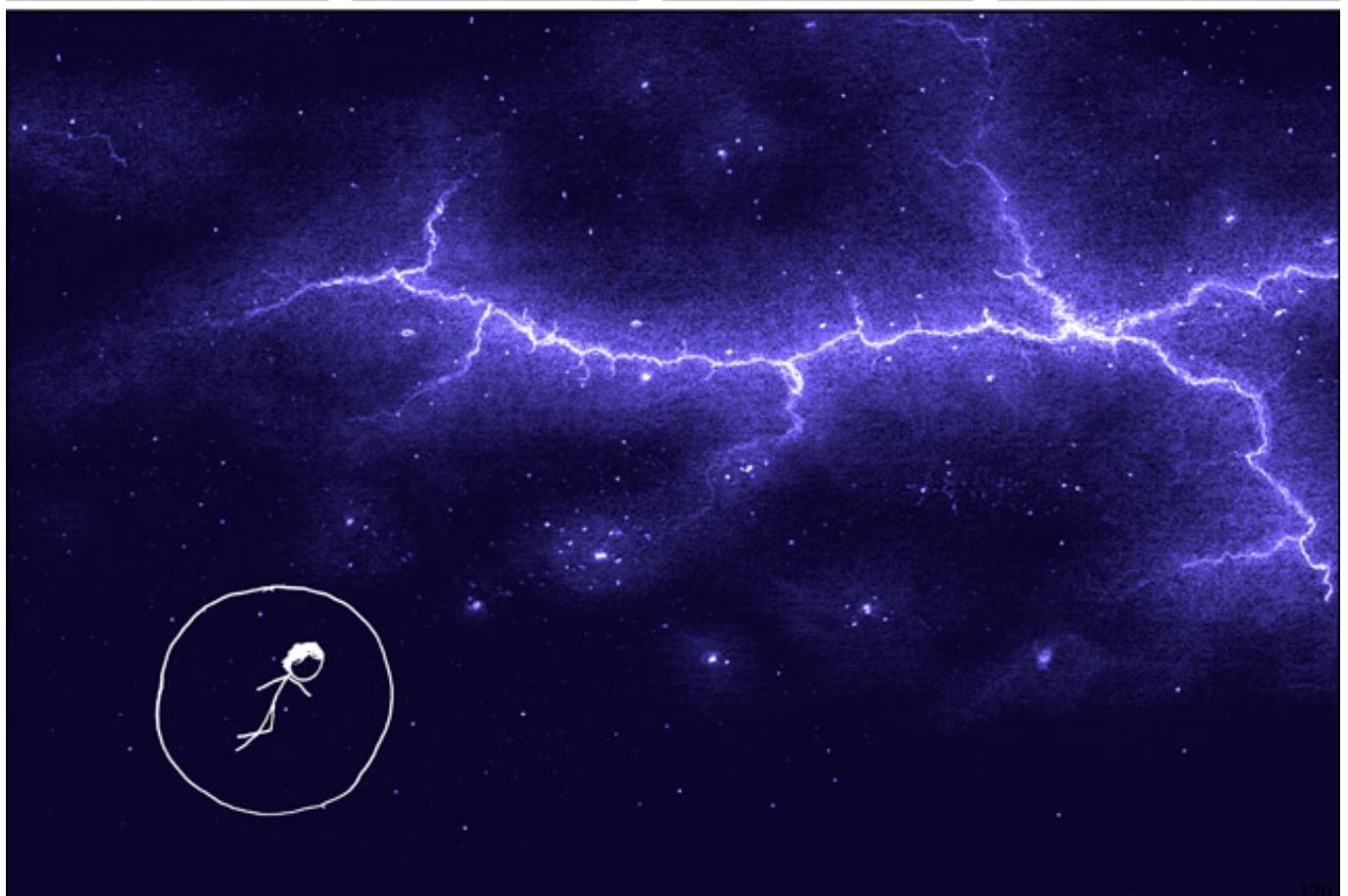
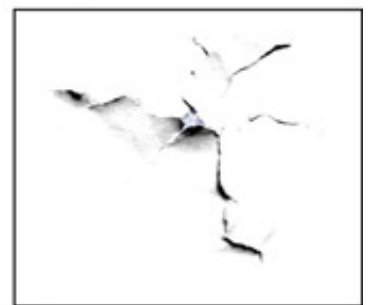
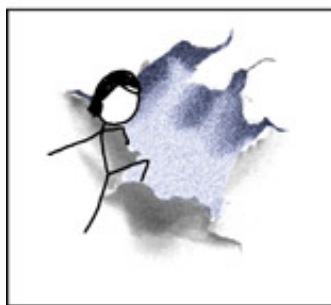
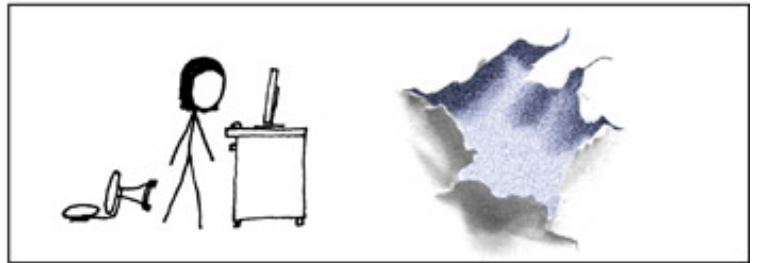
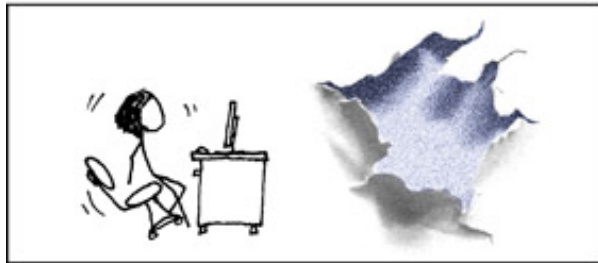
$a(b+c)=(ab)+(ac)$ . Politicize that, bitches.

### Explanation:

Megan and Cueball are teachers in this comic, talking about their students and the political discussions with them. Megan expresses concern that political discussions shake her beliefs in what's true, then worries that if she cannot trust herself to determine the truth, she can't trust herself to teach it. Cueball reassures her by saying that it's not possible to teach a singular, real truth. However, he is interrupted by a harrumph of the mathematics teacher Miss Lenhart and states that Mathematics is an exception (because math can actually be proved, conclusively). Randall likes mathematics because mathematical political discussions are not possible.

The title text shows a simple valid mathematical equation, the distributive property, and Randall is daring one to politicize it. Though this happened years after the comic was published, people have in fact politicized the distributive property, claiming that teaching it promoted socialism.

## **#264: Choices: Part 1**



Wait, damn, I think I spotted a new email on the last refresh.

### **Explanation:**

Megan is sitting at her computer, not waiting for a particular mail, but still refreshing every few seconds. This is an illustration of boredom and pointlessness in life. But suddenly the wall in front of her is opening. She considers running for the door, but curiosity overtakes her. She enters the hole, closes it behind her, and with that, she enters a different world. The hole appears as if it is a rip in a sheet of paper, implying that since they are drawings (which they are), [citation needed] this would be essentially a hole in space-time from their perspective. Most people would run away from such a thing, but Megan seems to feel that since she is currently bored (shown by the fact that she is constantly refreshing her E-mail), this is a break from her normal life, and she may not fully be realizing/acknowledging the inherent dangers of leaving her realm into an unknown universe.

In the title text, she worries that she is missing an email, though, much as a person often does resist breaking from routine.

This series was released on five consecutive days (Monday to Friday) and not over the usual schedule of three comics a week. These are all the comics in Choices series:

- 264: Choices: Part 1
- 265: Choices: Part 2
- 266: Choices: Part 3
- 267: Choices: Part 4
- 268: Choices: Part 5

## #265: Choices: Part 2

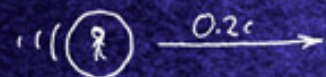
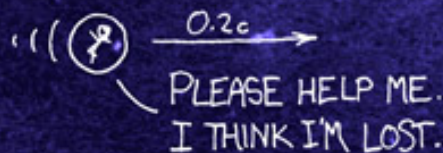
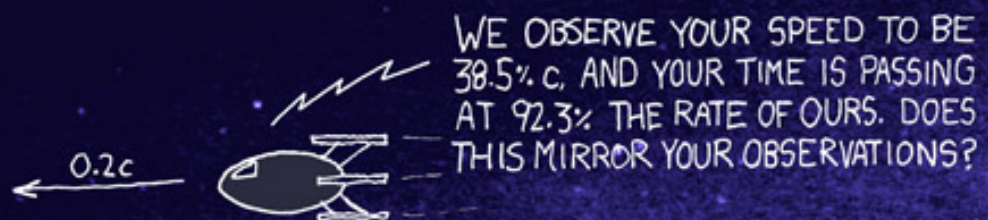
### CHAPTER 15: SPECIAL RELATIVITY

#### PROBLEM 1:

TWO SPACECRAFT TRANSMIT MESSAGES TO EACH OTHER WHILE PASSING AT CONSTANT VELOCITIES OF...



MEANWHILE:



Maybe someday I'll get to write the Wikipedia article about this place! Wait, damn, original research.

### Explanation:

The "Choices" series was released on 5 consecutive days (Monday-Friday). It explores and marvels at human freedom. This is, however, a little sidetrack from the "Choices"

narrative. Cueball is studying special relativity. The speed of light in a vacuum (299,792,458 m/s) is denoted as  $c$ . Megan and the spaceship are shown traveling at  $0.2c$  in opposite directions. This would mean (in Newtonian mechanics)  $0.4c$  relative to each other. But due to relativistic effects, their velocities do not simply add when the spaceship observes Megan; in reality, both would measure only  $0.385c$  ( $= (u + v)/(1 + uv/c^2)$ ) from the other's point of view. Also, time dilation influences the way time is observed with reference to the two frames of reference. Megan, however, has other concerns. (This text and part of the image were completely reused in the space part of the interactive 1350: Lorenz (see image here).

In the title text, Megan thinks about writing about this after-worldly place in Wikipedia, but then realizes that the content would be removed, due to the Wikipedia policy on original research, meaning that you are discouraged from writing your own thoughts, the preference being that you have a source you're paraphrasing. Even though her claims would be true, she would need reliable written sources to support them.

This series was released on five consecutive days (Monday to Friday) and not over the usual schedule of three comics a week. These are all the comics in Choices series:

- 264: Choices: Part 1
- 265: Choices: Part 2
- 266: Choices: Part 3
- 267: Choices: Part 4
- 268: Choices: Part 5



## #266: Choices: Part 3

I SHOULD  
FEEL SCARED.



BUT I DON'T.



MAYBE THIS  
IS A DREAM



BUT IT DOESN'T  
FEEL LIKE ONE.

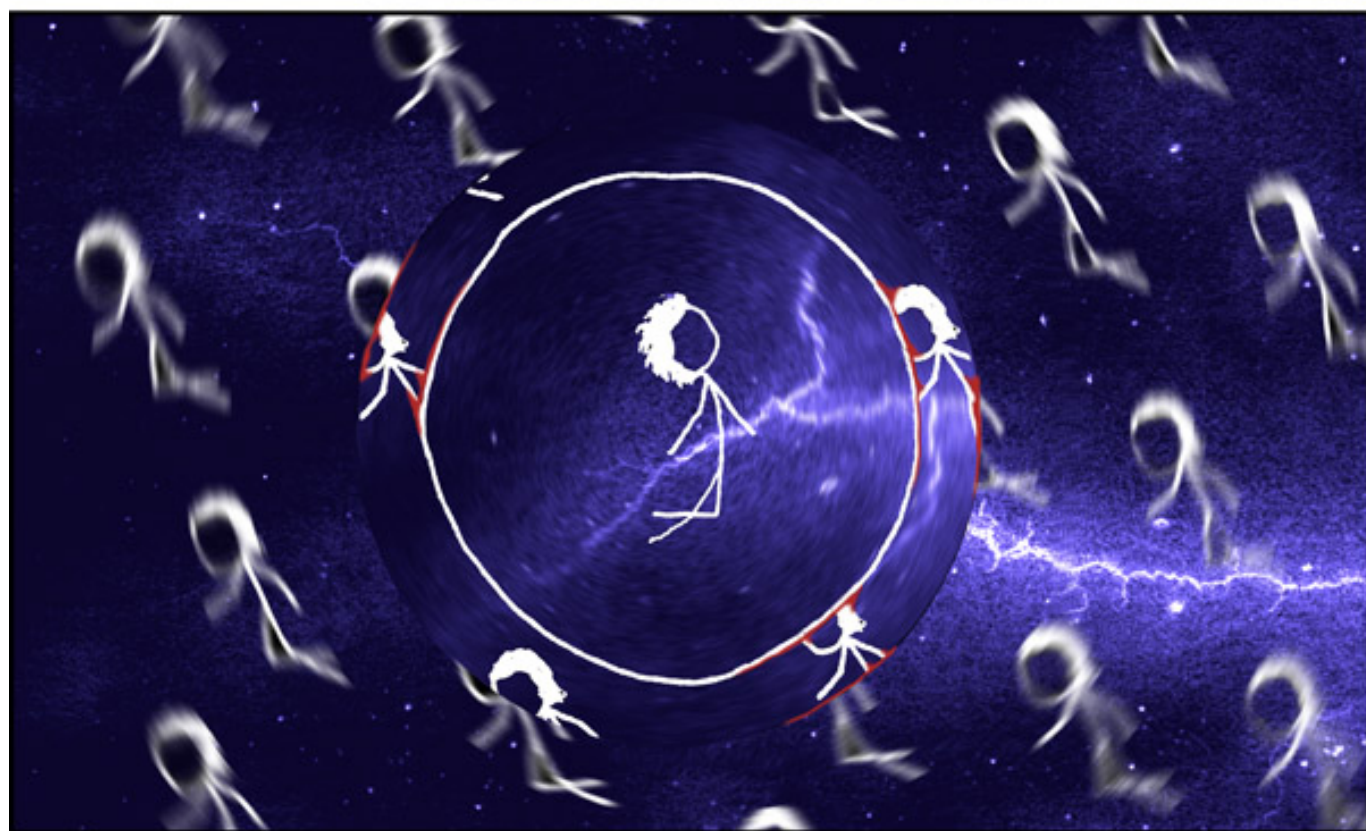


OKAY, FOUND YOU.  
WHO ARE YOU?



ER, HANG ON.

THIS NEXT PART MIGHT  
BE A LITTLE WEIRD.



SORRY—  
HI, ME.



Wait, this is space -- how are you talking to me? And, as an afterthought, what's up with the hole in reality?

### **Explanation:**

Megan is very unsure about what to think of her situation. Is it a dream? Is she in danger? She should be scared but isn't, and it does not feel like a dream, i.e. it feels real even though she suspects it is a dream. This would usually never be the case. If your dream feels realistic, you do not usually consider that you are dreaming. Suddenly someone talks off-panel and tells Megan that she has been found. When Megan asks the speaker who it is, reality becomes even more distorted, and suddenly she finds that she is looking at herself outside the sphere. And the two Megans say hi....

This could be an allusion to *The Matrix*. The Megan outside the sphere was looking for and has found the Megan inside the sphere, as in *The Matrix*, Morpheus has been looking for and has found Neo; then Morpheus/outer Megan pulls their target out of the target's reality and comment similarly on how this experience is likely to feel. Outer Megan, as she manifests before Inner Megan: "This next part might be a little weird"; Morpheus, as he is about to plug in Neo for the first time and explain what the Matrix is: "This will feel a little weird." If true, this would not be the only time Randall used *The Matrix* in xkcd (e.g., 566: *Matrix Revisited*).

In the title text, she realizes that if she were in real space, she wouldn't be able to hear any sound, like the voice talking to her, due to the lack of atmosphere. As an afterthought, she decides to ask about the hole in reality (which many people would consider to be more unusual than sound in space).

This series was released on five consecutive days (Monday to Friday) and not over the usual schedule of three comics a week. These are all the comics in Choices series:

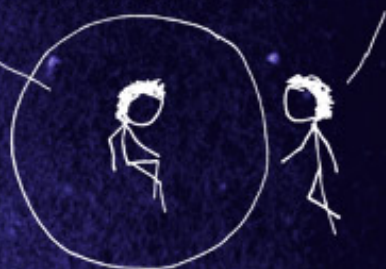
- 264: Choices: Part 1
- 265: Choices: Part 2
- 266: Choices: Part 3
- 267: Choices: Part 4
- 268: Choices: Part 5

## #267: Choices: Part 4



I SHOULDN'T DO THIS, BUT I PULLED YOU OUT FOR A MOMENT TO GIVE YOU A HINT. A HINT?

TAKE WRONG TURNS. TALK TO STRANGERS. OPEN UNMARKED DOORS. AND IF YOU SEE A GROUP OF PEOPLE IN A FIELD, GO FIND OUT WHAT THEY'RE DOING. DO THINGS WITHOUT ALWAYS KNOWING HOW THEY'LL TURN OUT.



WHY TELL ME THIS?

YOU'RE CURIOUS AND SMART AND BORED, AND ALL YOU SEE IS THE CHOICE BETWEEN WORKING HARD AND SLACKING OFF. THERE ARE SO MANY ADVENTURES THAT YOU MISS BECAUSE YOU'RE WAITING TO THINK OF A PLAN. TO FIND THEM, LOOK FOR TINY INTERESTING CHOICES. AND REMEMBER THAT YOU ARE ALWAYS MAKING UP THE FUTURE AS YOU GO.



SO, WAIT, WHAT IS THIS PLACE? AM I GOING TO WAKE UP THINKING THIS WAS A DREAM?

THIS IS... THINK OF THIS AS AFTER THE GAME, OUTSIDE THE THEATRE. TO GO IN, I HAD TO SUSPEND DISBELIEF, FORGET THE OUTSIDE.



SO YOU... HUH. WHY GIVE ME HINTS I'M GOING TO FORGET?

YOU'LL FORGET THIS TRIP BUT I THINK THE HINTS SHOULD STAY WITH YOU.

... IF THIS IS A GAME, ARE YOU - ARE WE - CHEATING?

YUP.



IS THAT A GOOD IDEA?

WELL, IT'S AN INTERESTING ONE. WE'LL SEE HOW IT GOES.

WELL, I GUESS I'LL SEE YOU AROUND -



WAIT A MINUTE; HAVE YOU BROUGHT ME HERE BEFORE?

I... MAYBE. ONCE.

FOR ANOTHER HINT?

ER.

ACTUALLY, WE JUST MADE OUT.

WE WH -

BYE!



Making out with yourself: now an official xkcd theme? Troubling.

### **Explanation:**

This is the existentialistic climax of the Choices series. It takes up the recurring xkcd-theme how people tend to be blind towards the staggering amount of possibilities that each day holds, with routine and boredom as a result. (See e.g. 137: Dreams and 706: Freedom.)

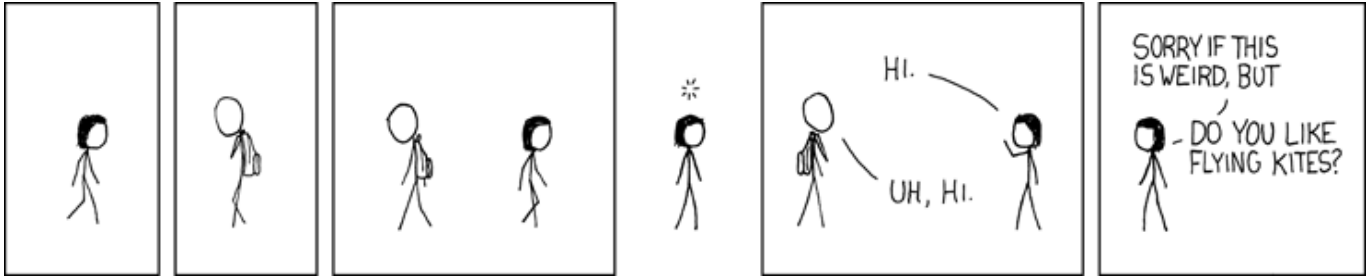
The Megan-clone implies that Megan has been taken to some kind of afterlife or parallel universe outside reality. It's not a dream, but she will not remember this place when she goes back. But the clone hopes that these hints will stay with her. Realizing that she would not remember being here, Megan suddenly realizes that she might already have been here before. And the clone admits that she has taken her to this place once before. Although not for another hint; actually it was to make out with herself. And then she quickly says bye.

The title text makes it clear that the Megan-clone did actually bring her previously into this place just to make out, and then refers to this being the second time this has been a theme, 105: Parallel Universe being the first. Randall appears to find this a little troubling (or it may be that he suspects his readers will).

This series was released on five consecutive days (Monday to Friday) and not over the usual schedule of three comics a week. These are all the comics in Choices series:

- 264: Choices: Part 1
- 265: Choices: Part 2
- 266: Choices: Part 3
- 267: Choices: Part 4
- 268: Choices: Part 5

## #268: Choices: Part 5



I wonder what percentage of not-obviously-busy people on the street would say yes to kite-flying with a stranger. This looks like a job for Science!

### Explanation:

In the final part of Choices, Megan is back to real life, and has forgotten about her trip, as afterlife-Megan said. However, she has an epiphany, and in the spirit of what she told her, she talks to the stranger on the street. The stranger is likely Cueball who studied the physics problem she encountered from part 2, as they both use a similar backpack. The urge to talk to strangers in awkward situations has been touched on in 235: Kite and can also be used when you are already flying a kite (see 1614: Kites.)

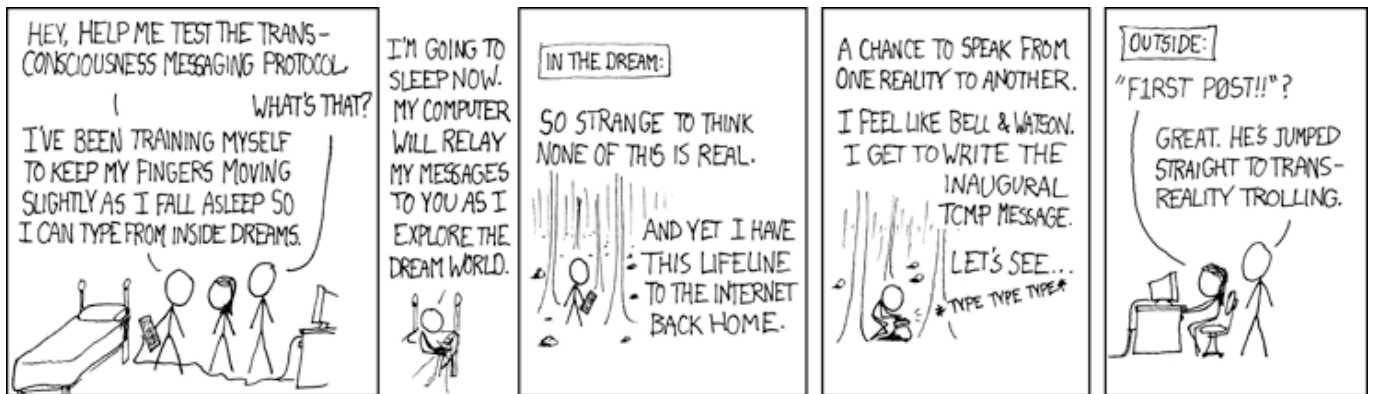
Notably, at the point in the comic where Megan has her epiphany, the panel border is absent. This brief disappearance of the boundary layer could symbolize Megan partially remembering the conversation she had with herself in the space 'outside the theater', her mind briefly making that outside connection before returning to her life with her other self's hints in mind.

The title text suggests a weird sociological investigation. The capital "S" in "Science" suggests a personification.

This series was released on five consecutive days (Monday to Friday) and not over the usual schedule of three comics a week. These are all the comics in Choices series:

- 264: Choices: Part 1
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- 266: Choices: Part 3
- 267: Choices: Part 4
- 268: Choices: Part 5

## #269: TCMP



A big obstacle in experimenting with the mind's dream-simulation-engine is holding onto the details as you wake up. With TCMP you can bring back any information you want.

### Explanation:

Cueball trained himself to type while asleep, so he could communicate from inside his dreams. He calls this Trans-Consciousness Messaging Protocol, or TCMP. He succeeds in using this system to send a message from inside his dream, but his friends, Megan and another Cueball, are disappointed when that first message is a trollish "F1rst p0st!!", in this case, "trans-reality trolling", instead of something constructive.

Firstposting, or thread sniping, is the practice of posting short messages to brag to others that you found and saw this content first. This practice was far more common at the time this comic was written, when high-traffic and poorly-moderated social media sites tended to display comments in increasing chronological order by default; as such, the oldest comments would be most prominently displayed at the top, while the newest comments would be buried at the bottom. These days, while low-traffic and closely-monitored forums still use this approach, social media sites instead tend to sort comments by rating, so that the most appreciated comments are given the most prominence and trollish comments like the cliché "F1rst p0st!!" are buried. See also 1019: First Post and 1258: First and regarding trolling 493: Actuarial.

"Bell & Watson" refers to Alexander Graham Bell and his assistant Thomas A. Watson. Bell is traditionally credited with inventing the telephone, because he was awarded the patent for it, although that is still controversial. His first phone call was to Watson in another part of their lab.

The forest Cueball is in may be a reference to the Wood Between the Worlds in *The Magician's Nephew*, the penultimate installment (though chronologically the first) of *The Chronicles of Narnia* by C.S. Lewis.

The name "TCMP" is likely to be a portmanteau of TCP (Transmission Control Protocol) and ICMP (Internet Control Message Protocol), which are actual protocols used in computer networking.

The title text explains how this protocol, if real, would be of great value in dream research, since you then would not have to worry about forgetting the dreams after waking up like as in 430: Every Damn Morning. You can relay the dreams as you experience them.



A possible downside is that in order for this to work, the dream has to be lucid, where the dreamer is aware that they are dreaming. This type of dream is very fascinating to Randall, as mentioned in the title text of 203: Hallucinations. Because this method could not be used to study regular dreams, some possibilities for studying dreams would be limited.

## #270: Merlin



I mean, the black-and-white stuff was running backward, but it hardly mattered to the story.

### Explanation:

Merlin is a wizard who features prominently in various retellings of the legend of King Arthur. The Once and Future King by author T. H. White is one of the most popular versions of the legend, and in it, Merlin is described as living backwards through time, as Cueball and Megan discuss in this comic (this is also briefly mentioned in the musical Camelot, which is based on this version of the story).

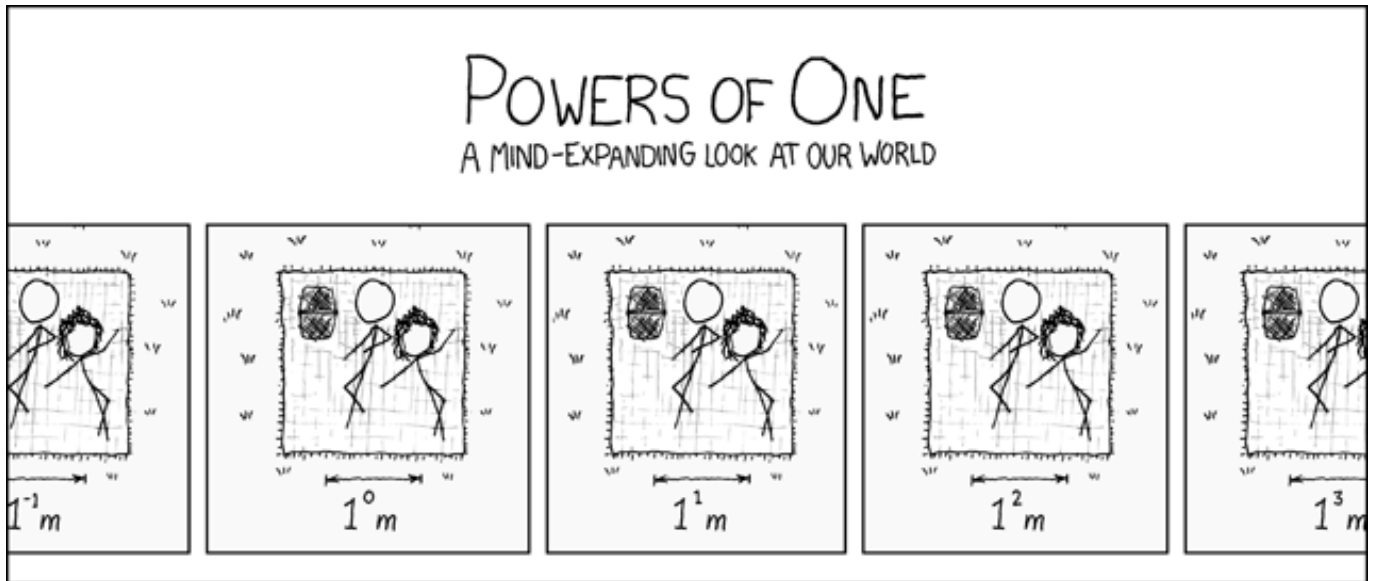
In the comic, Cueball is speculating philosophically on how this would have affected Merlin's life as he started life with all his memories, and gradually lost them, comparing this to Megan's own sense of unreality at goodbyes.

Many old people do, however, end up alone without friends or family. And they may do nothing but watch TV all day. They might also lose their memory. So in this respect, Merlin's last days may not be so different from many real people's, except of course that Merlin was supposed to live in the late 5th and early 6th centuries with no access to DVDs or even TV.

Memento is a movie telling the main parts of its story backwards, while a few black-and-white scenes are straightforward. So when Merlin watches the movie, he sees nearly the whole story in its actual order, and the title text drives home the joke by noting that these few scenes, which make more sense to someone with normal perceptions than the rest of the movie, would make less sense to him.

Normal old people would not be able to enjoy Memento like Merlin. Although he would of course always have remembered seeing it when he got old, until the day he saw it and then forgot it afterwards...

## #271: Powers of One



It's kinda Zen when you think about it, if you don't think too hard.

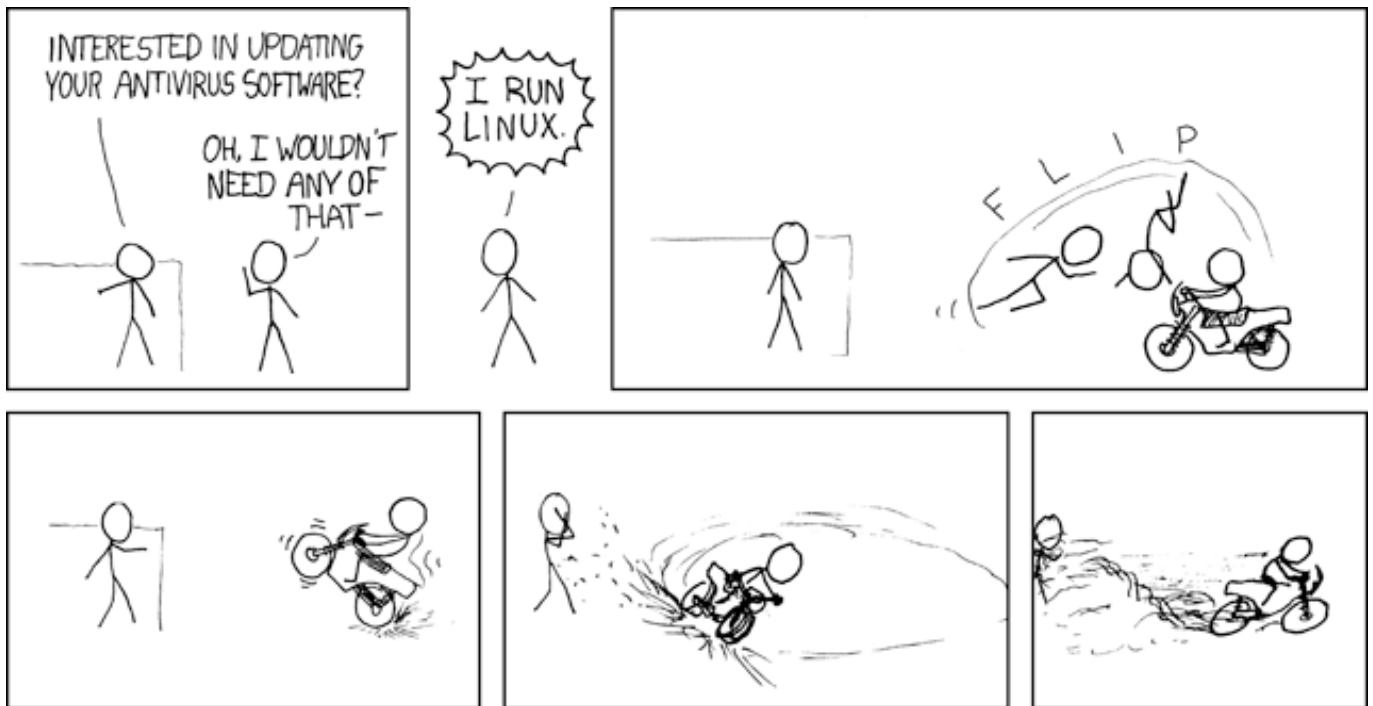
### Explanation:

This is a parody of the short documentary "Powers of 10," which can be found [here](#).

As in the documentary, the comic features a man and a woman having a picnic on a blanket. In the documentary, the apparent distance from the scene, and thus the zoom level, gradually changes by a factor of ten every ten seconds (hence the name "Powers of 10": 1, 10, 100, ...). In the comic, powers of one are used. Since all powers of 1 are 1, the image doesn't change at all, showing a series of identical images.

The title text refers to the Zen meditation (zazen), in which the meditator is supposed to suspend all judgmental thinking and let thoughts pass by without eliciting them consciously and without getting involved in them.

## #272: Linux User at Best Buy



We actually stand around the antivirus displays with the Mac users just waiting for someone to ask.

### Explanation:

Best Buy is an American chain of electronics and media stores. As with many such big box shops, they only sell pre-bundled software and boxed pre-built hardware, where the computers on offer are either Macs or other PCs, usually pre-installed with some variant of the Mac OS X or Windows NT operating system families. Most personal computer hackers/enthusiasts (as opposed merely to workaday computer users) wouldn't be caught dead buying a pre-made computer, preferring instead to build their own using self-selected hardware components and install and configure their own preferred operating systems and software. As such, the subtext is that somebody buying a complete pre-packaged home computer system at Best Buy wouldn't know or care much about computers.

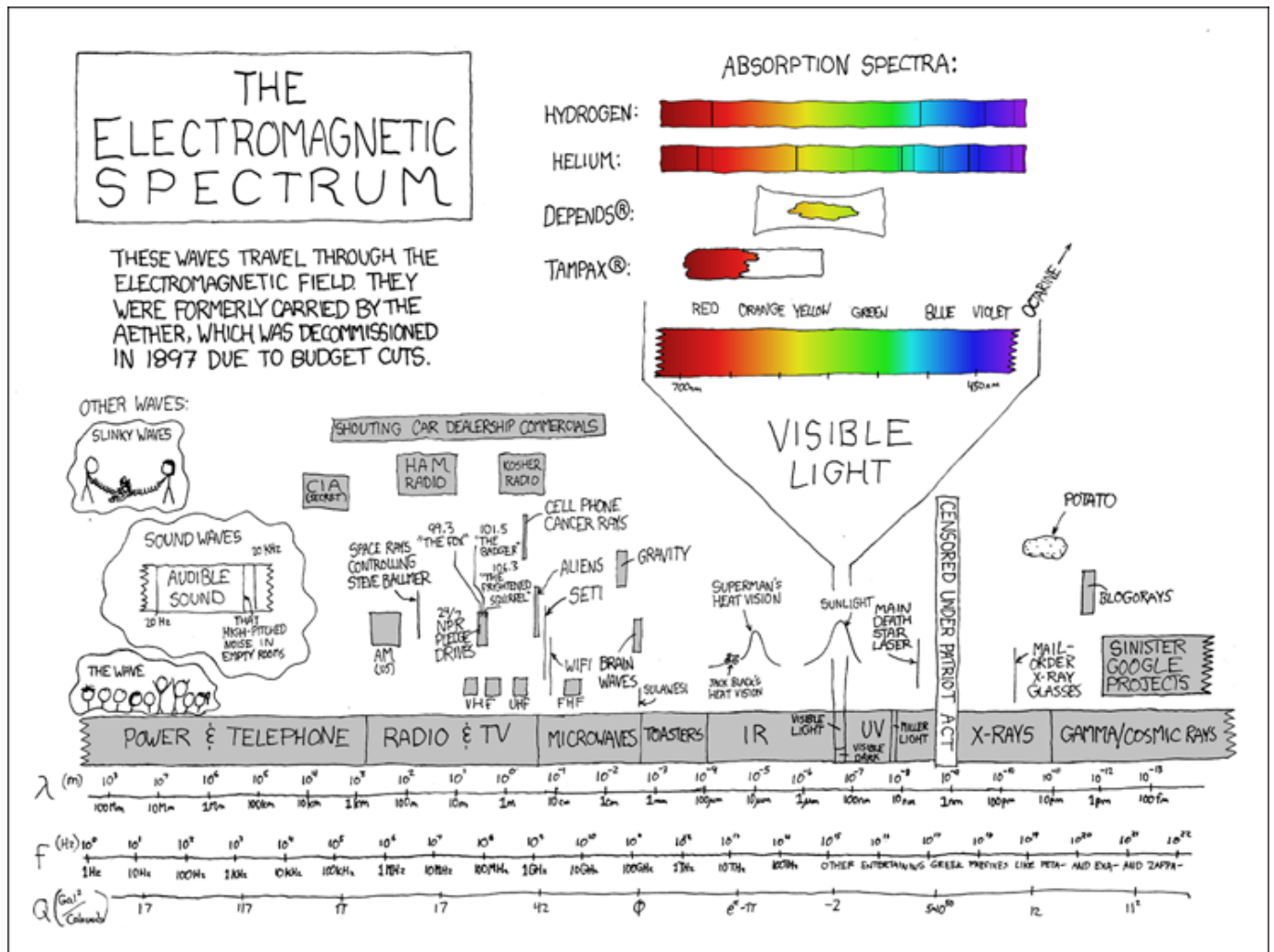
The salesperson is trying to sell antivirus software to Cueball because selling such software (e.g. Norton or Kaspersky) to prospective Windows PC owners is generally a good sales tactic. The vast majority of all computer malware is engineered specifically to exploit Windows because Windows has far-and-away the highest OS market share, and Windows' inherent anti-malware protection might most charitably be described with the phrase "lacklustre, but not as bad as before." Windows users therefore will want antivirus protection, especially for use on a brand new machine that will soon be connected up to the Internet. Moreover, because the ecosystem of viruses and malware that thrive by infecting Windows PCs is constantly evolving (see 350: Network) and being redesigned to take advantage of new exploits and fool last-month's antivirus software, it is quite prudent for a Windows PC owner to always keep their malware protection absolutely up-to-date, and many such security suites need to be regularly renewed with new versions.

While some viruses and malware can afflict Linux systems, in general Unix-like operating systems (including Linux distributions and BSD) are far more robust and secure than Windows, with fewer exploitable vulnerabilities. Perhaps even more importantly, Linux (not counting Android, which was not yet released) has a far smaller consumer market share, therefore offers less incentive to malware makers to target it. Therefore, Cueball is confident (rightfully so) that he will be fine without additional security. Moreover, Linux distros are free software, which means that anyone is able to audit the code and fix security bugs. Although malware protection usually isn't necessary, if extra protection is desired by the user, such as for tasks requiring very high security standards (such as on servers and supercomputers), there are anti-malware solutions available such as ClamAV.

Back in 2007, when the less popular Windows Vista was released and with a stagnant Mac market, many in the Linux community believed that Linux would soon wipe out Windows as the operating system of choice for desktop PCs, after years of slow-but-steady growth. This explains the cheeky triumphalism of the final panels of the comic, in which Cueball hops on his quick, slick vehicle and speeds away. It's worth noting that this desktop reversal has not happened, though Linux did achieve a peak in popularity in 2011, just as Windows users were laboriously switching from Windows XP to Windows 7, with Linux peaking again in 2014 and Windows arguably in decline, and in any case, desktop PCs themselves have slowed in sales, losing ground first to laptops and most recently to embedded devices, where Linux use does indeed heavily exceed the competition, e.g. Android (which is loosely based on the Linux kernel) handily out-competing both the previously dominant iPhone (which was first released mere days after this comic) and the never-popular Windows Phone.

The title text makes sense in light of the fact that, like Linux, the software design of OS X (both are based on Unix, OS X through Darwin - see 676: Abstraction) limits the amount of harm that can be done by malicious software, and Macs thus also have fewer viruses and malware than Windows. Apparently, Mac and Linux users flock together just waiting for some salesperson to come along and mistake them for someone gullible enough to use Windows. There is a notion that Macs can't get infected, but Mac malware is on the rise. This is taking the piss out of the smugness sometimes to be found among Mac and Linux users, who may view their preferred systems as hip and different from the "mainstream" Microsoft systems that they feel are manifestly inferior.

## #273: Electromagnetic Spectrum



Sometimes I try to picture what everything would look like if the whole spectrum were compressed into the visible spectrum. Also sometimes I try to picture your sister naked.

### Explanation:

This panel is a play on the Electromagnetic spectrum, showing a large piece of the spectrum and examples of phenomena that absorb or emit light along the spectra. Such spectra are commonly used in physics or astronomy education contexts when discussing the nature of light. This comic extends it to absurd lengths by including examples that may be variously hyper-specific, humorous, or non-EM phenomena.

The first two scales at the bottom show the wavelength  $\lambda$  (in meters) and the frequency  $f$  (in Hertz) of the wave. The values are related as  $\lambda = c/f$ , where  $c$  is the speed of light. The last line showing  $Q$  (Gal<sup>2</sup>/Coloumb) is nonsense; Gal (galileo) is a unit of acceleration (1 cm/s<sup>2</sup>), and Coloumb is a likely typo for Coulomb, the SI unit of electric charge. Photons do not have acceleration in the traditional sense of the word, and are electrically neutral (thus carrying no charge).

In 1887, the Michelson–Morley experiment proved for the first time that the aether theory was wrong. The year (1897) cited underneath the comic title may be an incorrectly-dated reference to this experiment. Nevertheless, after that time, many

physicists like Hendrik Lorentz or Joseph Larmor were still working on some aether theories. Albert Einstein's theory of Special Relativity in 1905 helped explain the theoretical basis for the lack of aether and was a definitive step in discarding previous work.

The wavelength starts at high values on the left and decreases in a logarithmic scale to the right. As a result of the inverse relationship between frequency and wavelength, the frequency scale starts at low values and increases logarithmically. Both scales are labeled with powers of ten and with metric prefixes. For frequencies above 100 tera-Hertz, it just says "other entertaining Greek prefixes like peta- and exa- and zappa-." The last prefix should be zetta- (denoting a factor of  $10^{21}$ ), but is intentionally mislabelled, referencing musician Frank Zappa. The nonsense Q parameter does not change monotonically with either frequency or wavelength. On the scale, there is 17, an unlucky number in Italy. Next to it, Randall seems to offer an alternative, 117. After that, pi, a mathematical constant, is followed by another 17 and then by 42, the answer to Life, the Universe and Everything. Then, there is phi, another mathematical constant, followed by e to the pi minus pi, a joke referencing 217: e to the pi Minus pi. To make this scale even more absurd, Randall adds  $-2$ ,  $540^{50}$ , 12 and  $11^2$  to the end of the scale.

Three drawings of other types of waves than the electromagnetic type:

- Slinky waves by a coil. These can be either longitudinal or transverse waves, depending on the manner in which the Slinky is driven. Notably, Randall has drawn the Slinky as tangled up; if you've ever played with a Slinky, you know how frustrating it is to untangle it.
- The human audio spectrum (from 20 Hz to 20 kHz). The "high-pitched noise in empty rooms" refers to tinnitus. This was later referenced to in 1590: The Source.
- "The Wave" in a stadium, a transverse wave phenomenon that travels through people.

"CIA (Secret)" is a joke about all the wiretapping on phones and such.

"Shouting car dealership commercials" is a reference to the massive and often extreme advertising for car retailers. Ham radio is a private amateur radio used for communication. "Kosher radio" is playing with the ambiguousness of the word HAM. Kosher is a Jewish law for food, and it states, amongst others, that Jews are never allowed to eat meat from the unclean pigs - so no ham! Some frequencies of famous FM broadcast stations. "99.3 The Fox" is a modern rock station in Vancouver, British Columbia. "101.5 The Badger" is a classic rock station in Madison, Wisconsin (home of the University of Wisconsin, whose mascot is a badger). "106.3 The Frightened Squirrel" is not a real station, but makes a play off of the animal names commonly used as nicknames for either radio stations, programs, or hosts. The rays controlling Steve Ballmer are nonsense, but may reference real Balmer series, a set of transitions in the hydrogen atom that produce photons in the optical and ultraviolet light range. AM Amplitude modulation, VHF Very high frequency, and UHF Ultra high frequency are frequency ranges approved for commercial broadcasting companies. "Cell phone cancer rays" is playing with the belief of many people that mobile phones may cause cancer. Aliens belong to a range slightly higher than the frequencies used by human communications. So they can't hear us. Cell phones as a cause of cancer was later referred to in 925: Cell Phones.

SETI is the "Search for ExtraTerrestrial Intelligence" project trying to find messages

from aliens. Most genuine astronomical research in this area concentrates in the microwave and radio regimes. Since aliens work at different frequencies on this diagram, that might explain why there has of yet been no positive results from SETI. WIFI is the standard for wireless computer communications. FHF is probably "Fucking high frequency;" it is not an abbreviation for any broadcasting frequency ranges and lies above the (real) V(ery)HF and U(ltra)HF. Gravity waves are a phenomenon in fluid dynamics, and distinct from Gravitational waves. Neither is related to electromagnetic emission. Brain waves could be a reference to Neural oscillation. Sulawesi is an island in the Indian Ocean that belongs to Indonesia, whose shape has several wave like features.

This is a pun on the microwave oven, which emits light at its namesake frequencies to cook food. It also takes a stab at people who claim that microwaved food is dangerous, by pointing out that toasters also heat food using electromagnetic radiation, of frequencies just higher than microwaves. (The actual spectrum of a toaster goes all the way into visible frequencies.)

Infrared belongs to heat. The reference to Superman covers his heat vision power, which has been used many times within the canon. American comedian Jack Black starred in a proposed scifi/comedy television show in 1999 titled "Heat Vision and Jack", which covered the adventures of an astronaut and his talking motorcycle.

At the bottom, it is split into "visible light" and "visible dark." While dark is the opposite of light in many grammatical contexts, in the physical sense it only reflects the absence of visible photons. The human visible spectrum is shown by all colors, including octarine, the color of magic on the fictional Discworld (in the books by Terry Pratchett). On top, there are two absorption spectra, hydrogen and helium. These are the two most common elements in the Sun, and their presence in the Sun's outer envelope and Earth's atmosphere does block some small frequencies from the Sun. Next come two cases of absorption in the chemical/technical meaning. Depends is a brand of underwear for adults experiencing urinary or faecal incontinence. The color is consequently yellow. Tampax is a brand of tampon. The color is, therefore, red.

Ultraviolet light cannot be seen by humans. No entries here.

Miller Lite is a lager beer. "Light beer" typically has a lower alcohol content and calorie count, although it is also usually a light color for beer.

One section is reserved for "Main Death Star Laser". In Star Wars the Death Star was a space station with a green laser cannon powerful enough to destroy planets. (It is unclear why its spectrum is well outside of the visible range.)

No entry because it's censored; this is a humorous exaggeration of how much authority the government can supposedly exercise under said bill.

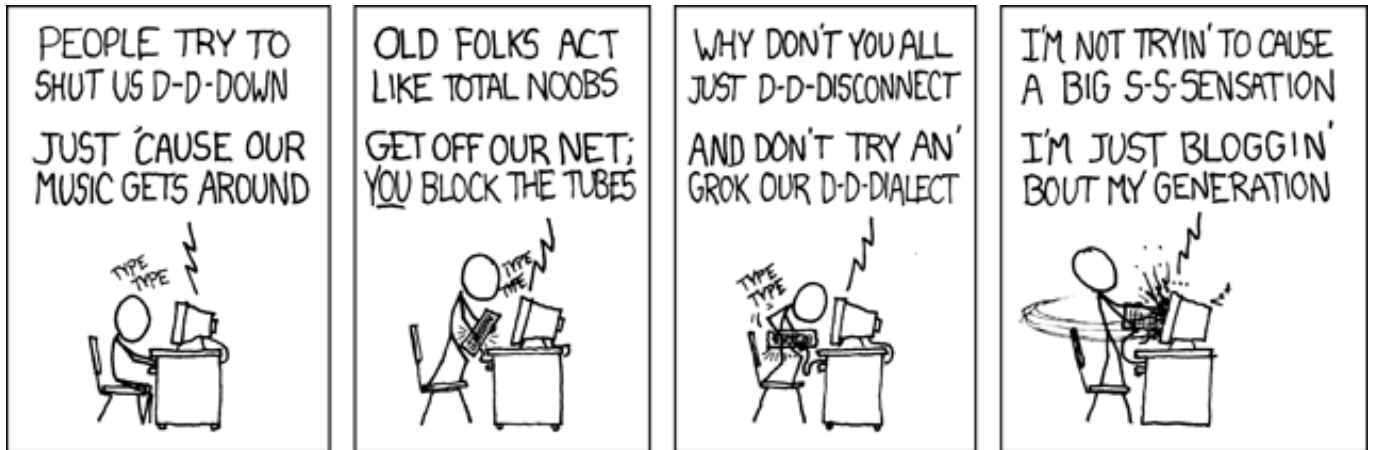
Potatoes absorb and reflect radiation waves the same way humans do, because their chemistry and water content is very similar to the human body. Look here: Boeing uses potatoes to improve Wi-Fi signals. Mail-order x-ray glasses refers to a novelty item based on an optical effect, not actual x-rays. Google Glass did not exist at the time when this comic was created.

Blogorays are emitted by the Blogosphere; apparently only Randall can detect them. Sinister Google Projects: Google, despite having a motto "don't be evil", has such significant power that it is a frequent target of conspiracy theories.



Randall likes to speculate what the world would look like if humans could see radio waves, gamma waves, etc. Such a thought experiment would be pretty abstract due to the total lack of a frame of reference (since everything outside the visible light spectrum is by definition invisible and thus beyond human optical perception), but for many people, that's also what makes it enticing. Randall immediately turns this profound train of thought around with a crude joke that he wants to know what the viewer's sister would look like in the nude, an activity for which x-rays would be useful.

## #274: With Apologies to The Who



Trivia: Roger Daltry originally wrote 'Don't try an' Digg what we all say' but erased the second 'g' when he moved to reddit.

### Explanation:

This comic refers to the song "My Generation" by the British rock band The Who, which was released in 1965. The song is about intergenerational conflict and has been regarded as a very decided proclamation of youthful rebellion. Cueball adapts the lyrics to describe his own generation, the Millennials. As people born from the 1980s onwards grew up with the internet, this generation is also nicknamed "digital natives." It is therefore natural that the updated lyrics should refer to blogging and internet slang. The actions performed by Cueball while typing the text relate to the original music video, in which The Who smash their instruments in true rock star fashion. Cueball wails his keyboard like a guitar and smashes his monitor in the end.

The title text jokingly suggests that the band's lead singer Roger Daltrey originally meant the line

as a reference to the social news site Digg, but changed it after switching to its competitor Reddit.

An explanation of the terms in this comic:

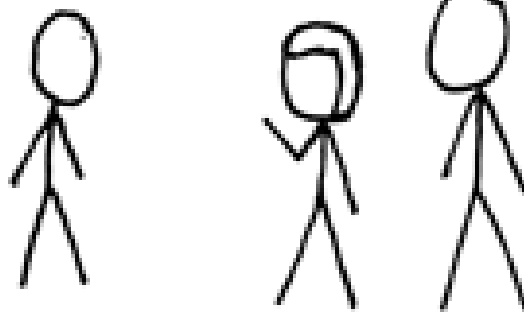
The original lyrics of the song run as follows:

WHEN MEETING A GIRLFRIEND'S FAMILY,  
I HAVE TO SUPPRESS THE WEIRDEST THOUGHTS.

HI!

HI! IT'S SO NICE TO  
FINALLY MEET YOU!

I HAVE LICKED YOUR  
DAUGHTER'S NIPPLES.



And now I might never get to again.

### Explanation:

This comic relates to the situation of getting introduced to the parents of one's girlfriend, which is often felt to be rather awkward. The parents tend to scrutinize and question the aspirant in order to find out if he is a good catch. A particularly delicate issue is the fact that the suitor may have had sexual intercourse with their daughter. This topic is almost never openly addressed, but can sometimes be felt in the subtext of the conversation. This makes the scenario somewhat susceptible to a so-called Freudian slip. The term describes a common psychological phenomenon where a subconscious

thought bursts through and induces, for example, a slip of the tongue.

In the comic, Cueball tries to repress any thoughts of sexual nature while talking to her parents Blondie and Blondie's Cueball-like man. He promptly utters the sentence "I have licked your daughter's nipples." and thus involuntarily addresses the topic he tried to avoid.

The title text suggests that either the parents do not want their daughter to meet him again, or that the girlfriend interdicts his licking her nipples again because of the embarrassing scene.

From xkcd: volume 0:

```
<rob> hi
<emily> hey you
<rob> last night was nice
<emily> the best i've had
<rob> yeah it was AMAZING
<emily> ok, i have to ask
<emily> is this for real?
<emily> or is it just sex
<rob> definitely just sex
<emily> holy shit
<emily> are you serious?
<emily> you don't know how much that made
        my stomach hurt
<emily> i want to cry
<rob> i'm sorry
<rob> i wanted to type 'i love you'
<rob> but our line lengths were syncing up
<emily> ...
<rob> and it would have broken the pattern
* emily has disconnected
```



I wish I knew how to quit this so I wouldn't have to quit you.

### **Explanation:**

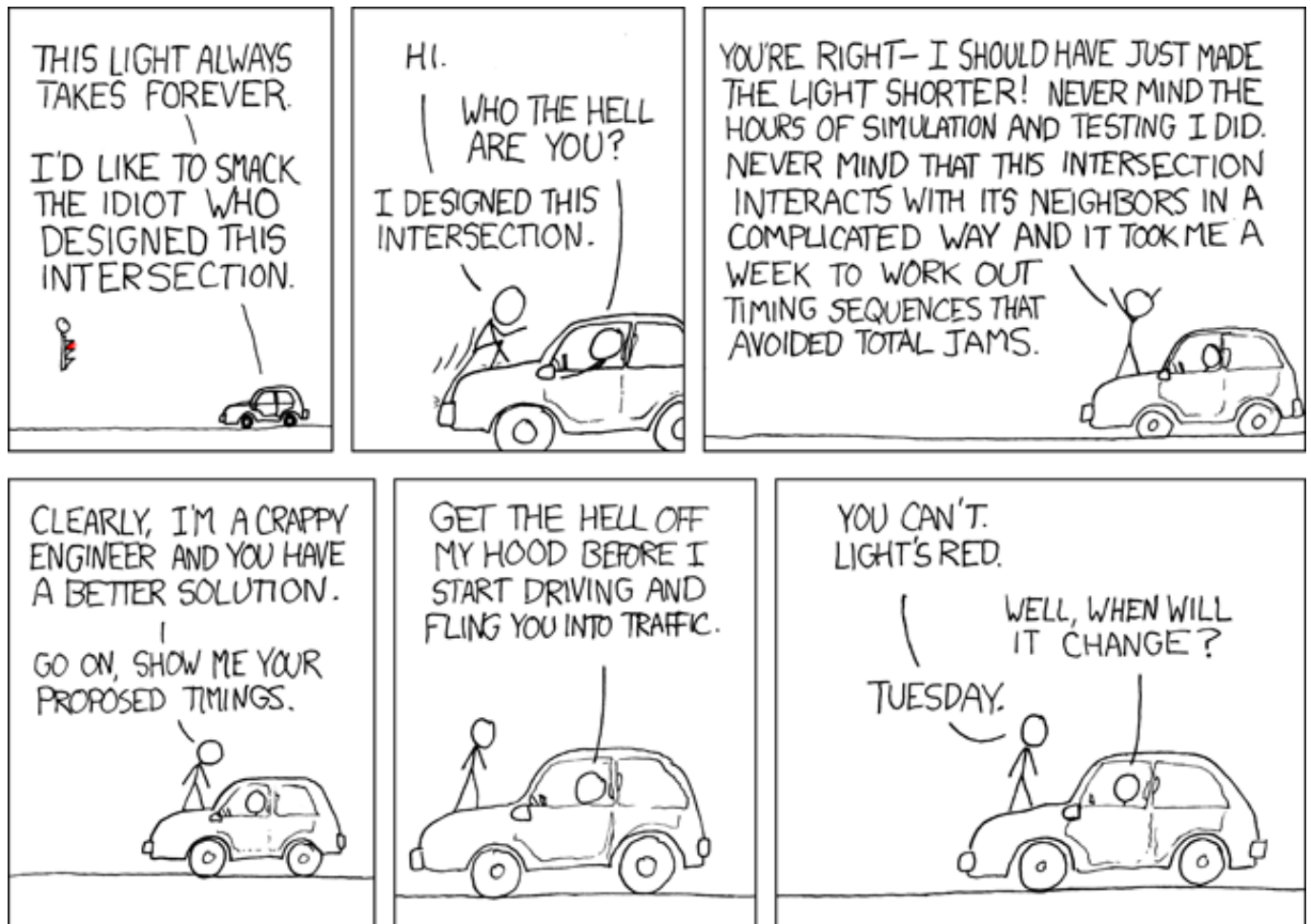
Fixed width or monospaced font refers to the font used in old teletype terminals and some instant messaging clients (often Courier).

For two text lines to have the same length, it's easier if they are in a monospaced font. For example, the following sentences are the same length in a monospaced font, but since we are using a proportional font, those lengths are not exact (the third line is noticeably wider):

The title is possibly a double reference, both to a monospaced font and to lines of the same length. Initially, by mere chance, Emily's and Rob's lines were exactly the same length. This made Rob want to continue the pattern. That Rob feels forced to change what he wants to type to continue the pattern could be a symptom of obsessive-compulsive disorder. Because of the monospaced font, any reply with nineteen characters (including space) would have continued the pattern. For example, "definitely for real" or "i'm in love with you" would have worked, but Rob didn't seem to think about them

In the title text Rob continues to write a sentence: "I wish I knew how to quit this so I wouldn't have to quit you." He acknowledges that he has a problem, since he cannot quit his desire to keep the fixed width. If he could have quit this desire, then he would not have had to quit Emily. But since he felt he had to keep the fixed width, he involuntarily wrote something that felt for Emily as if he quit her. And he was too late out with his apology for her to read it.

## #277: Long Light



You can look at practically any part of anything manmade around you and think 'some engineer was frustrated while designing this.' It's a little human connection.

### Explanation:

This strip depicts a common experience to most people - becoming frustrated with a device, system, or rule that appears to be badly made or have no purpose other than to frustrate the user (in this case, a traffic light that seems unreasonably, inexplicably long). One temptation we might have in these cases is to blame the designer of the system. Here, the designer appears and testifies to the amount of effort that went into the design, considering many factors. He challenges Cueball to come up with a better solution, the implication being that without a similar amount of training and effort, any naive solution would have flaws the designer would be happy to point out. This demonstrates to Cueball and the reader that just because they were unlucky enough to encounter something in a way that was inconvenient for no obvious reason, doesn't mean there is no reason at all.

Of course, all of this has occurred after the designer leapt out of nowhere onto the hood of the car, so he may not be entirely stable. This is elaborated upon in the final panel, where the designer finally admits that red light won't change until Tuesday, but since this comic was published on a Friday, the timing scheme really was absurd after all. It is also possible that the designer has intentionally changed the light specifically to make Cueball wait for a couple of days, or to stop himself from being flung off of the hood of

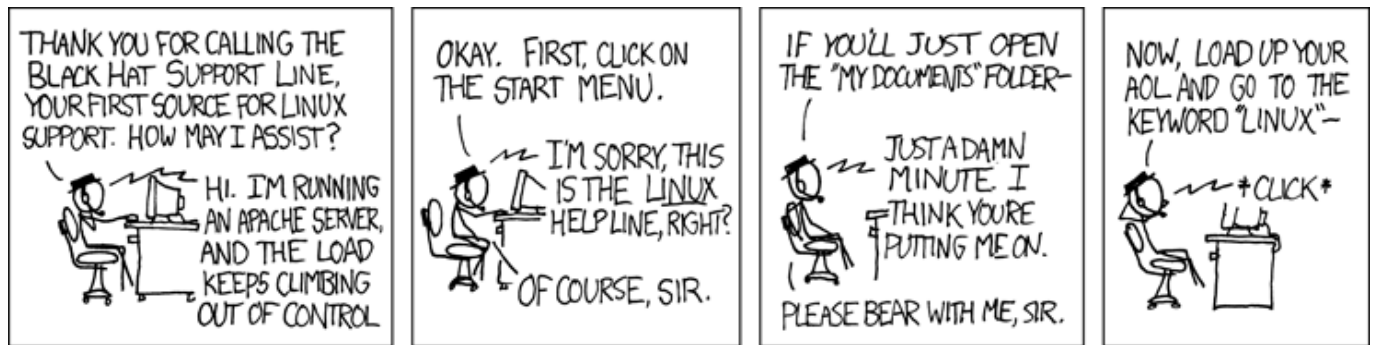
the car.

The title text returns to the original point, reminding us that designers work hard and often encounter complex problems in doing their jobs. Their frustration may also be in part from the knowledge that future users will blame them for unavoidable problems and undervalue their work. With a little empathy, we can find a human connection to these problems, rather than let them drive us crazy.

Randall returns to the theme of the unseen contributions of engineers in 1741: Work.



## #278: Black Hat Support



So as not to leave you hanging -- it was a problem with `select()` calls.

### Explanation:

This strip portrays Black Hat providing support for Linux, but in fact he provides only annoying and unhelpful advice just for his own personal amusement.

The support line is clearly for Linux, as stated in the introduction, and the client on the phone clearly has a Linux problem. However, Black Hat is intentionally giving irrelevant instructions that refer to the Windows OS (Start Menu, My Documents Folder).

Finally, Black Hat asks the client on the phone to "bear with him" and suggests that the client should use a highly obsolete mechanism to look for the answer to his problem, namely AOL keywords. AOL is well known for producing one of the earlier online communities and has since fallen largely out of favor. The client hangs up the phone.

The title text mentions the function `select()`, which allows you to write asynchronous IO access routines by checking if it is ready to be read/written to at a specific moment. This is different than a threaded model, in that it can happen in a single thread. The danger of such programming is that if you do not coordinate the reader/writer properly, you can create a deadlock, which can result in the consumption of a lot of resources.

## #279: Pickup Lines



That shirt looks good on you, but it would look even better stuffed into the neck of a vodka bottle and flung burning through our office building's window. Let's fucking do it and never look back.

### Explanation:

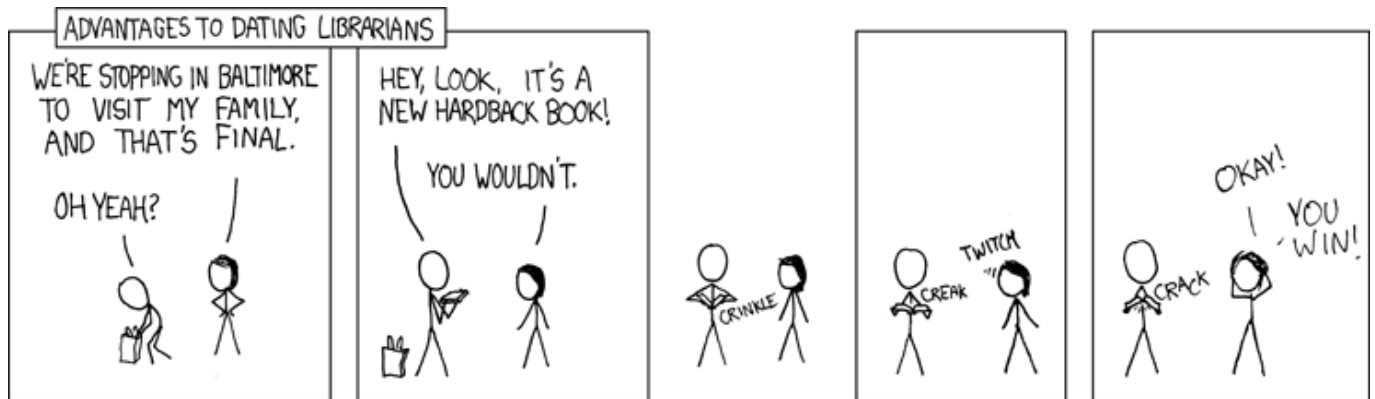
This comic adds strange twists to some classic abysmally cheesy pickup lines. Warning, terrible puns ahead:

- "If I could rearrange the alphabet, I'd put U and I together."
- "Is your father a thief? Because he stole all of the stars in the sky and put them in your eyes." (Is Your Dad Pick Up Lines)
- "You must be tired, 'cause you've been running through my mind all night."

This is yet another example of Beret Guy's bartender job.

The title text refers to a pickup line like this: "That shirt looks good on you, but would look even better on my bedroom floor." But here the shirt is used as fuse for a Molotov cocktail thrown into their office.

## #280: Librarians



Don't expect any leniency on late fees, though.

### Explanation:

Cueball is pressing on Megan for stopping her idea to visit her family. While Megan is fully convinced that this visit will happen, Cueball takes advantage of her love of books. He starts to open up a brand-new hardcover book much farther than it was made to open, ruining the spine, and then mistreats it some more. Megan cannot take this anymore, and gives up on the family visit.

The title text goes on with the inflexible stereotype, as librarians will not make exceptions for or give reductions to their romantic partners' overdue fees. Alternately, it could mean that a librarian who is faced with the abuse of books as a bargaining tool would take retribution by not making an exception for late fees for their partner, particularly if said partner is absent-minded or otherwise disorganized.

The humor comes from the stereotype of librarians as very sensitive to proper treatment of books and inflexibility with rule-breaking.

# ONLINE PACKAGE TRACKING:

PROs:

CONVENIENT  
USEFUL

CONS:

MAKES YOU  
CRAZY

\*REFRESH\*

/ AWW, STILL IN MEMPHIS.

\*REFRESH\*

/ AWW, STILL IN MEMPHIS.

\*REFRESH\*

/ AWW, STILL IN MEMPHIS.



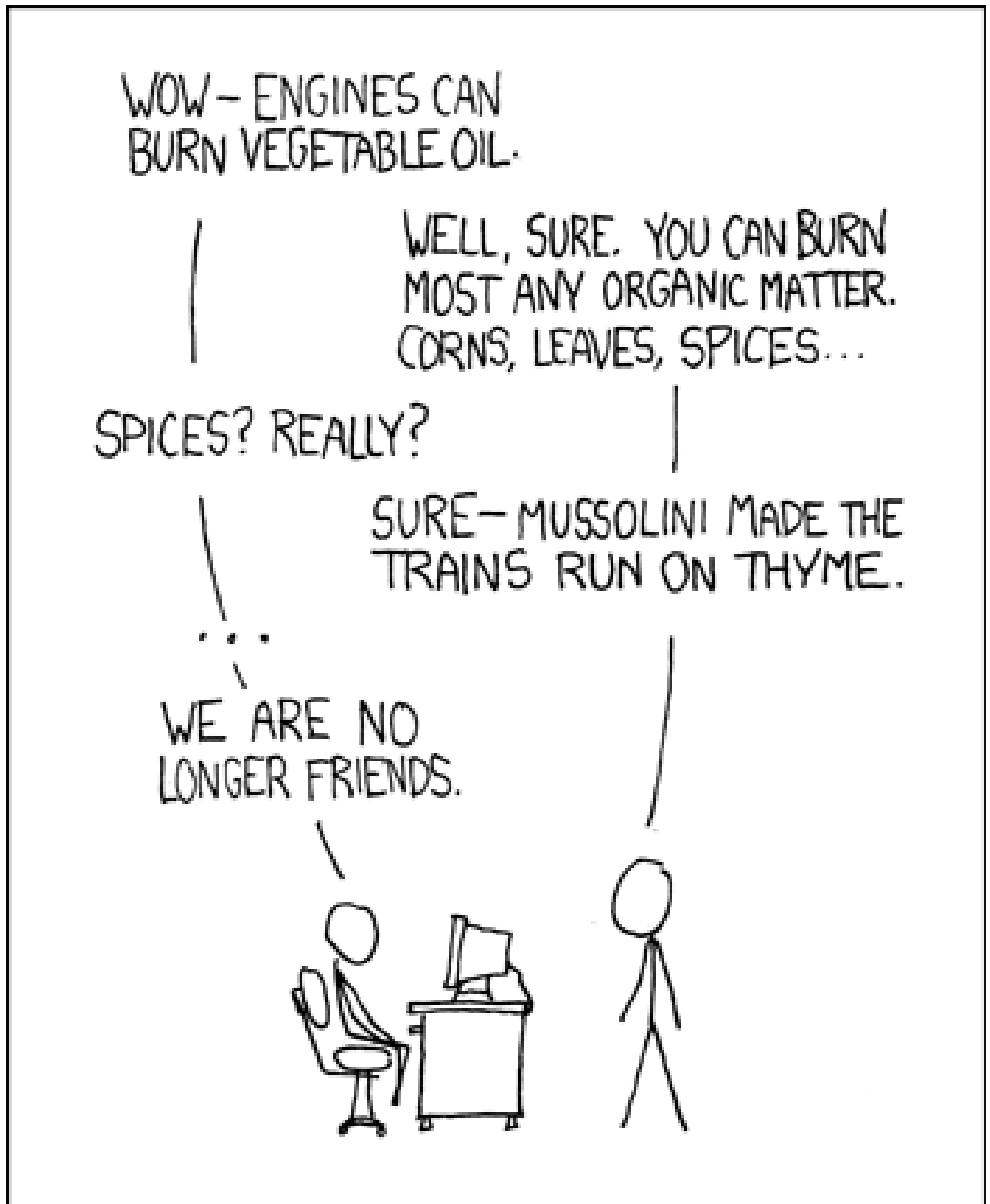
I don't even \*want\* this package! Why did I join the stinging insect of the month club, anyway?

**Explanation:**

Randall notes that package tracking, as provided by many shipping companies like UPS and FedEx Express, is helpful, as customers can see the status of their package delivery, and most people are very excited in the expectation of a package as shown in 576: Packages. However, Megan refreshes the package tracking page every few minutes in her impatience on the status of her package; it drives her crazy.

The headquarters of FedEx Express are located in Memphis, and it also serves as its global "SuperHub" located at Memphis International Airport.

The title text refers to the various "x of the month clubs" (fruit, cheese, wine, etc.) that one might have signed up for, only to receive a gift. But you are often not really interested in these gifts, and probably even less interested in receiving a stinging insect each month.[citation needed] This, combined with the ease by which a person can track the package, creates a strange dichotomy whereby you don't really want the package, but you keep checking where it is just because you can.



I have nothing to apologize for.

**Explanation:**

Cueball is fascinated about engines that can burn organic matter. But in fact, biofuel is a

big industry today. It is criticized now and then, because it can affect food prices and is believed to exacerbate world hunger. Next comes a reference to the famous quote, "Mussolini made the trains run on time," an oft-quoted piece of propaganda from Italy under Fascist dictator Benito Mussolini. The pun is made on the fact that thyme (an herb, or as in this comic, a spice) and time (the universal phenomenon, as in the original quote) are homophones. But the organic matter thyme could technically be used as fuel. Randall later made another joke on the fact that thyme and time are homophones: 1123: The Universal Label.

The title text may be interpreted in one of two ways. It may be attributed to the pun-maker, in which case he makes no apology for his corny joke, or it may be attributed to Cueball, in which case he makes no apology for the termination of friendship, since the pun was too terrible.

## #283: Projection



Out in a field, not another car for miles, silence but for the rain drumming on the sunroof, warm thick folds of the blanket hiding wordless fingertip games ...

### Explanation:

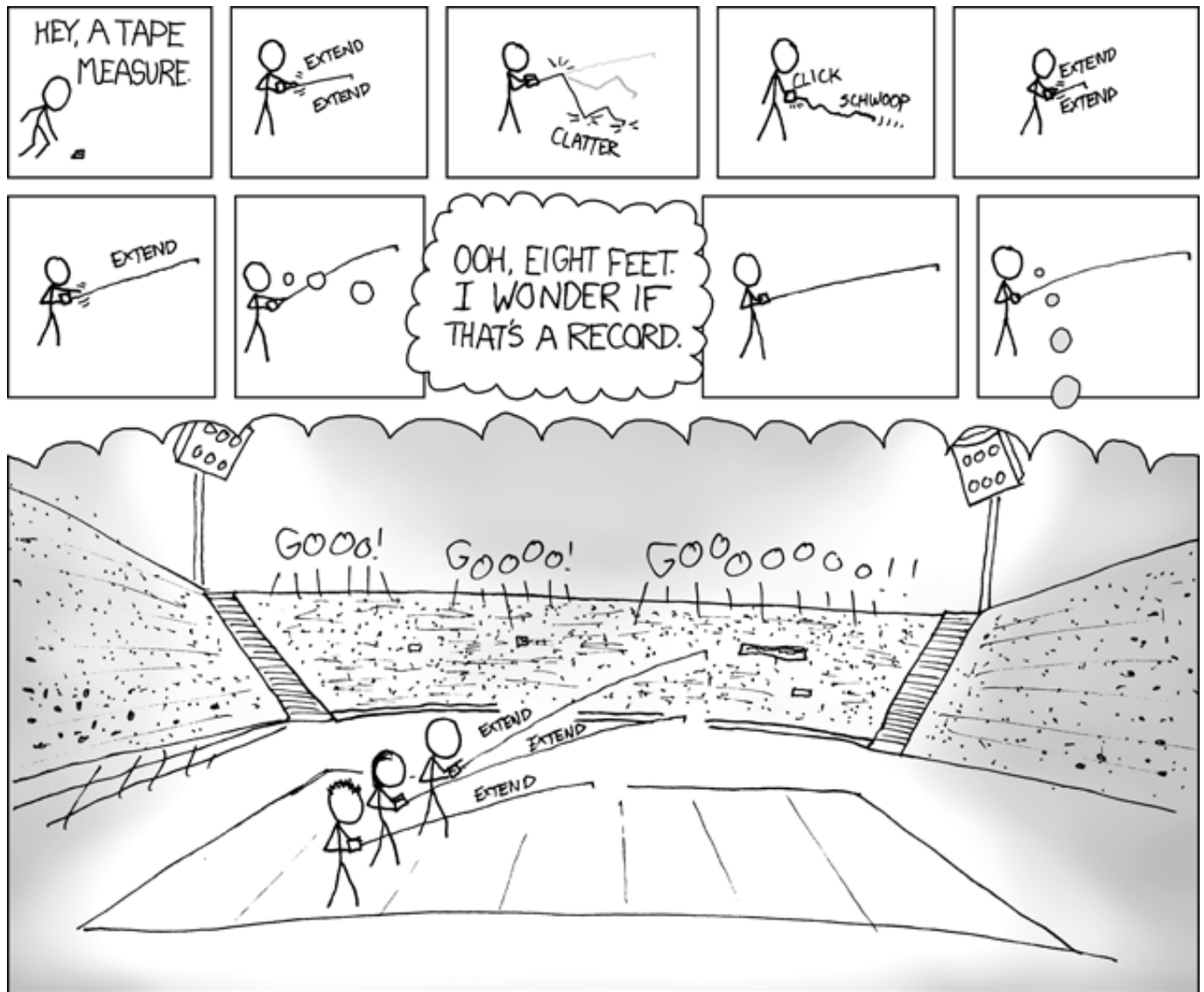
Cueball and Megan are watching a movie on a couch. During the movie, a scene features a character's face with legible text projected by the monitor. Though commonly depicted for dramatic effect, this phenomenon does not actually occur with conventional monitor technology. Megan is annoyed and agitated by the inaccuracy of the effect. Cueball agrees and delves more into the optical underpinnings of projected images, but in the process segues into a romantic memory of the two of them in a parked car in the rain.

At that point, the two lose interest in the movie and begin making preparations to drive to the nearest rainstorm for another romantic evening experience.

This was the second time in four months that Randall mentions Pet Peeves. The first was 238: Pet Peeve 114. The next, 1138: Heatmap, did not appear until more than five years later.



## #284: Tape Measure



This sequence was later reproduced in the International Tape-Extending Federation archives, retitled 'The Founding of the Sport'.

### Explanation:

Cueball acts childishly, finding a tape measure and then playing with it. He then extends it to 8 feet (approx. 2.5 meters), wondering whether or not that was a record, which makes him imagine a sport where extending the tape measure as far as possible was the goal.

Tape measure strips, of the 'spring metal' kind are manufactured with a slight inherent curve upwards, laterally, where not curved along their length (e.g. whilst still on the spool). Extending the tape straight out from the spool, the sideways curve dominates and adds structural strength to keep the relatively light tape-strip supported against gravity. By doing so, it allows fairly easy operation to extend a tape upwards (e.g. from the floor to the ceiling of a room) or for a smaller distance sideways (e.g. the width of a picture-window) without needing a second person or the extra effort of hooking the 'end hook' over something at the 'end-point' before pulling the case back forwards the 'start'. The tape can also still be bent around corners or circumferences, at the loss of

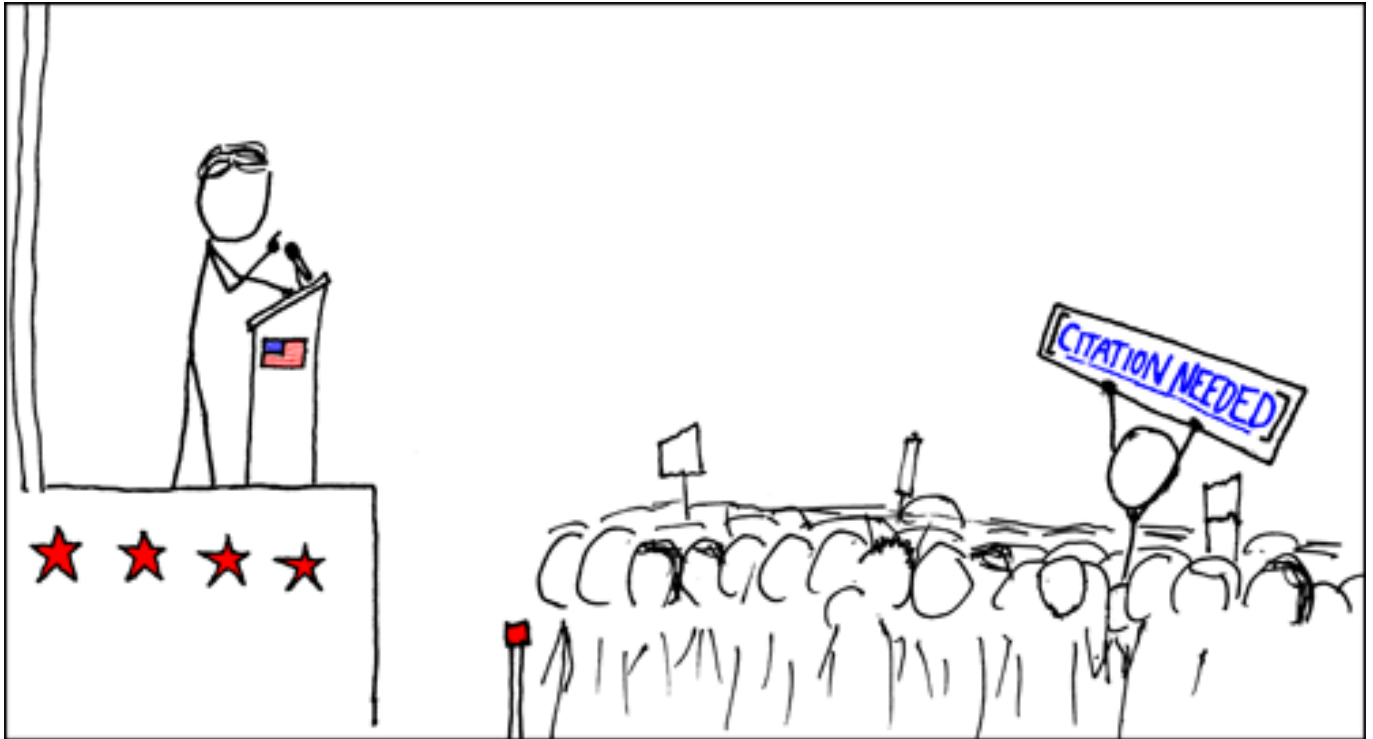
local longitudinal strength and perhaps some accuracy, if a single straight-line distance isn't desired. It is this combination of flexibility and rigidity that makes such tapes so useful for common household and maintenance measurements larger than a piece of paper (for which a rigid ruler is more useful) but smaller than a property's yard area (where a surveyor's non-sprung metal tape might be laid out) and not habitually involving curves (as with a draper's cloth tape).

However, as a tape measure is extended (especially horizontally), the weight of the strip eventually does overcome the support offered by the bend, causing it to collapse. As cleverly depicted in the comic, a single point tends to 'crumple' (often where vibrations from the handling induce a resonance; and tending towards where the cantilever forces are greatest, near where the operator is currently drawing the tape out) and this then causes a collapse in which other bends introduce themselves from the dynamics of the tape in motion and the force of its impact on the ground/other objects.

Skillfully and steadily holding the tape measure at an angle can redirect some of the weight load, reduce the momentary tendencies to cross the 'bending threshold' and allow for a longer total extension. Vertically, it is likely that most such tape can support itself (with minimal care) against collapse, but would reach no length at all in a sideways direction. The ultimate aim of those who attempt idle 'tape extending' challenges is often to achieve the longest horizontal extension. Or the highest 'figure' revealed from the tape, whilst doing so, which would actually be the length of the slightly arced diagonal, but would be fairly close to the slightly smaller 'reach length' attained, and usually good enough for idle entertainment. However, it is implied that this technique can be explored to the point of becoming its own sport, at which point one presumes that professional "competitive tape extension" would rely solely upon the observed horizontal extension (without, or prior to, hitting the ground), with competitor's chosen extension techniques with their standard (competition-grade) tapes perhaps even making on-tape graduations unnecessary and totally irrelevant.

The title text refers to a future where this sport exists, and this comic is a representation of the origin of this sport.

## #285: Wikipedian Protester

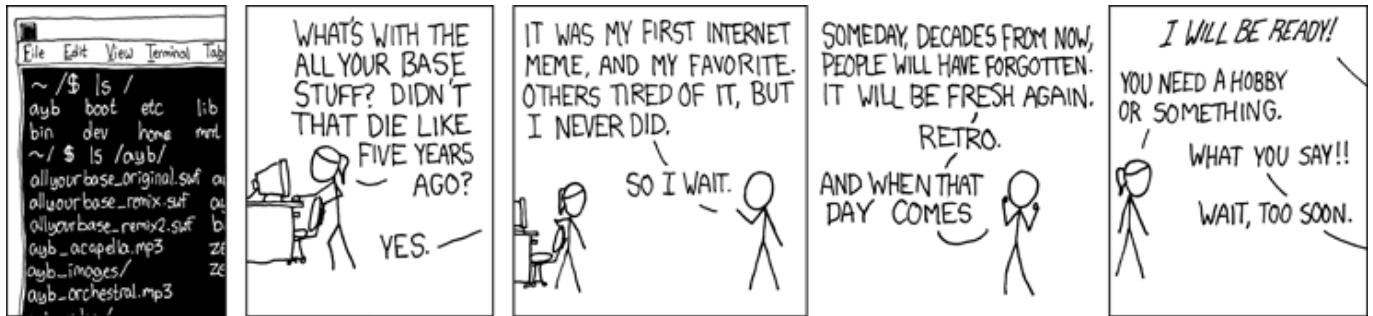


SEMI-PROTECT THE CONSTITUTION

### Explanation:

The title text represents an alternative sign the protester could be holding. It is a pun on popular phrase "protect the Constitution", which urges politicians to pass and enforce laws in a way that preserves the rules and rights set down by the U.S. constitution. "Semi-protect" is a reference to the Wikipedia semi-protection policy, which is used to prevent important articles from being edited anonymously or by new users. Semi-protection on an article is shown by displaying this lock on the top right of an article. Constitutional amendments are proposed by Congress, which isn't anonymous, meaning that in effect, all articles of the Constitution are technically already semi-protected. Funnily enough, the "Constitution" and "Constitution of the United States" articles on Wikipedia are now semi-protected due to excessive vandalism.

## #286: All Your Base



The AYB retro-return-date (Zero Wing Zero Hour) should be around AD 2021.

### Explanation:

The comic refers to a popular internet phenomenon (meme) called "all your base are belong to us." This catchphrase originated from the arcade shooter game "Zero Wing" and is a popular example of a poor translation into the English language. The phrase was popularized throughout the Internet and referenced in various images and videos. It is considered one of the earliest Internet memes, with the first occurrences dating back to the year 1998.

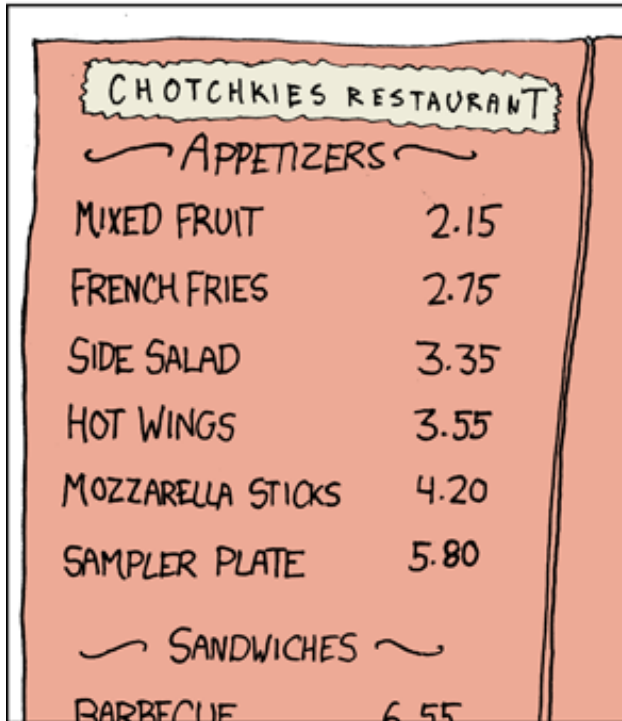
Cueball has, according to the comic, participated in the spread of the meme during its heyday. Ponytail, examining Cueball's root directory, wonders at his keeping the content he created years ago, as the meme's popularity has decreased massively since then. Cueball answers that this was always his favorite meme, and that he is waiting for the day it gets revived. His second-to-last line, "What you say!," is a line from the game as well, although he says it much sooner than its supposed return to popularity.

By using the example of internet memes, the comic also relates to the general principle of fashion, that everything once popular will, after a long enough time, be again in vogue. Trends experiencing this renaissance are often referred to as retro. Internet phenomena can be observed to follow the same rule, although with much shorter intervals due to the speed of information turnover.

The title text prophesies the return of the "all your base" (AYB) meme in 2021 (similar-sounding to "AD 2101," the date mentioned at the beginning of the game). It also contains a pun on the term "zero hour" and the name of the game, which initially brought the phrase into fashion.

The title text's prediction may have been fulfilled by Congresswoman Alexandria Ocasio-Cortez.

## MY HOBBY: EMBEDDING NP-COMPLETE PROBLEMS IN RESTAURANT ORDERS



CHOTCHKIES RESTAURANT	
APPETIZERS	
MIXED FRUIT	2.15
FRENCH FRIES	2.75
SIDE SALAD	3.35
HOT WINGS	3.55
MOZZARELLA STICKS	4.20
SAMPLER PLATE	5.80
SANDWICHES	
BARBECUE	6.55



General solutions get you a 50% tip.

### Explanation:

Another entry in the My Hobby series. Cueball is embedding NP-complete problems in restaurant orders. Specifically, he is ordering appetizers not by explicitly stating the names, but by the total price of them all. This is a simplified example of the knapsack problem. This is a problem in combinatorial optimization, as follows: If you have a knapsack (backpack or rucksack) that can hold a specific amount of weight, and you have a set of items, each with its own assigned value and weight, you have to select items to put into the knapsack so that the weight does not exceed the capacity of the knapsack, and the combined value of all the items is maximized.

In computational complexity theory, NP stands for "nondeterministic polynomial time," which means that problems that are NP take polynomial running time (i.e. the time a CPU would take to run the program would be polynomial in the input size) to verify a solution, but it is unknown whether finding any or all solutions can be done in polynomial time. Polynomial time is considered efficient; exponential and higher times are considered unfeasible for computation. NP-complete problems are ones that, if a polynomial time algorithm is found for any of them, then all NP problems have polynomial time solutions. In short, particular guesses in NP-complete problems can be checked easily, but systematically finding solutions is far more difficult.

The waiter's problem is NP-complete, since a given order's price can be found and checked quickly, but finding an order to match a price is much harder. This causes the order to effectively be an application layer denial-of-service attack / algorithmic

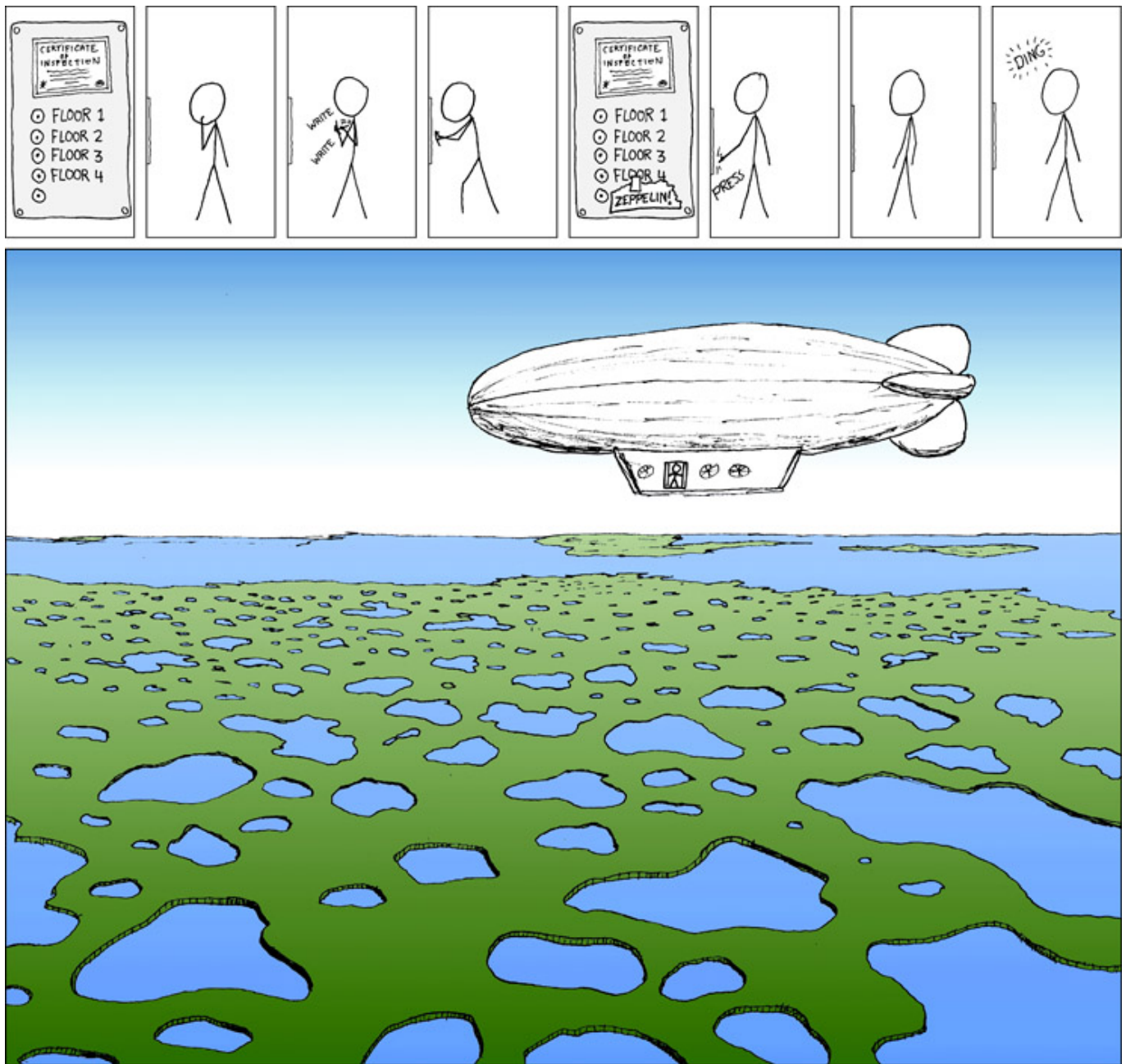
complexity attack on the waiter, similar to Slowloris or ReDoS. (Formal proofs of the NP-completeness of the knapsack problem can be found at the above link.) The most straightforward way for a human to find a solution is to methodically start by first listing all the (6) ways of choosing one appetizer, and their total costs, then list all the (21) ways of choosing two appetizers (allowing repeats), and then list all the (56) ways of choosing three appetizers, and so forth. As any combination of eight appetizers would be more than \$15.05, the process need not extend beyond listing all the (1715) ways of choosing seven appetizers.

Another famous NP-complete problem is the travelling salesman problem, mentioned by Cueball at the end, referring to the waiter's claim that he has 6 more tables to get to. (see also 399: Travelling Salesman Problem).

The title text refers to the fact that NP-complete problems have no known polynomial time general solutions, and it is unknown if such a solution can ever be found. If the waiter can find an efficient general solution to this, he will have solved one of the most famous problems in mathematics. This problem is one of the six remaining unsolved Millennium Prize Problems stated by the Clay Mathematics Institute in 2000, for which a correct solution (including proving that such a solution doesn't exist) is worth US\$1,000,000. A 50% tip is slightly less than fair.[citation needed]

For those curious, there are exactly two combinations of appetizers that total \$15.05 and solve the problem posed in the comic strip:

## #288: Elevator



Quick, try it with 'LOVE'.

### Explanation:

Cueball is in an elevator, and notices that, beneath the certificate of Elevator Inspection, mandatory in all U.S. elevators at least, there are buttons for Floor 1, 2, 3, and 4, and then a mysterious unlabeled button. Possible logical conclusions he might have made include (1) there is a fifth floor reachable by pushing the bottom button which for some reason is not labeled; or (2) the button has some other function, a common one is to stop the elevator wherever it may be; or (3) the panel with the buttons is from a template used for various elevators with up to five floors, and as this particular elevator only goes to four floors, the bottom button is unlabeled, and nothing will happen if he pushes it.

He has, however, chosen to believe in a different explanation: the fifth button is not currently assigned, but giving it a label will assign it to whatever floor or other function

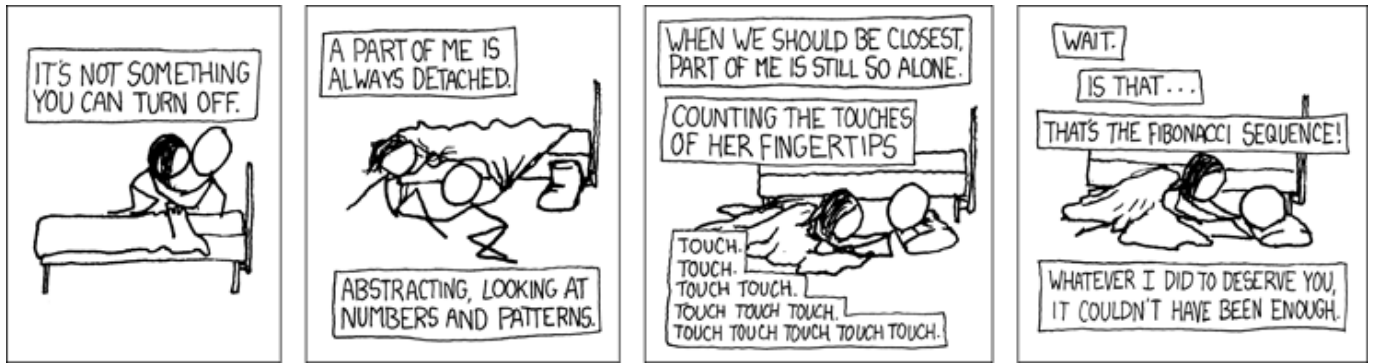
he can give it. The possibilities are truly endless. And so, the intrepid Cueball writes "Zeppelin!" on a slip of paper and tapes it next to the unassigned button, thereby assigning it to move the elevator not to Floor 5, but to a Zeppelin. And it works; the elevator opens aboard a Zeppelin floating in the air, high above a land with many glacial lakes, perhaps Minnesota, Nunavut, or elsewhere on the Canadian Shield.

The specific choice of a "ZEPPELIN!" is a reference to 73: Zeppelin. That comic, in turn, referenced Zeppelin watches, which may have the word "ZEPPELIN!" replacing one of the numerals on the dial. In the previous comic, having the hour hand of the watch pointing at the word invoked the appearance of a zeppelin.

The title text is most likely a reference to the Aerosmith song "Love in an Elevator," which really is about sex in an elevator. However, it would also be great if one could reach the elevation of love by getting there in a magic elevator.



## #289: Alone



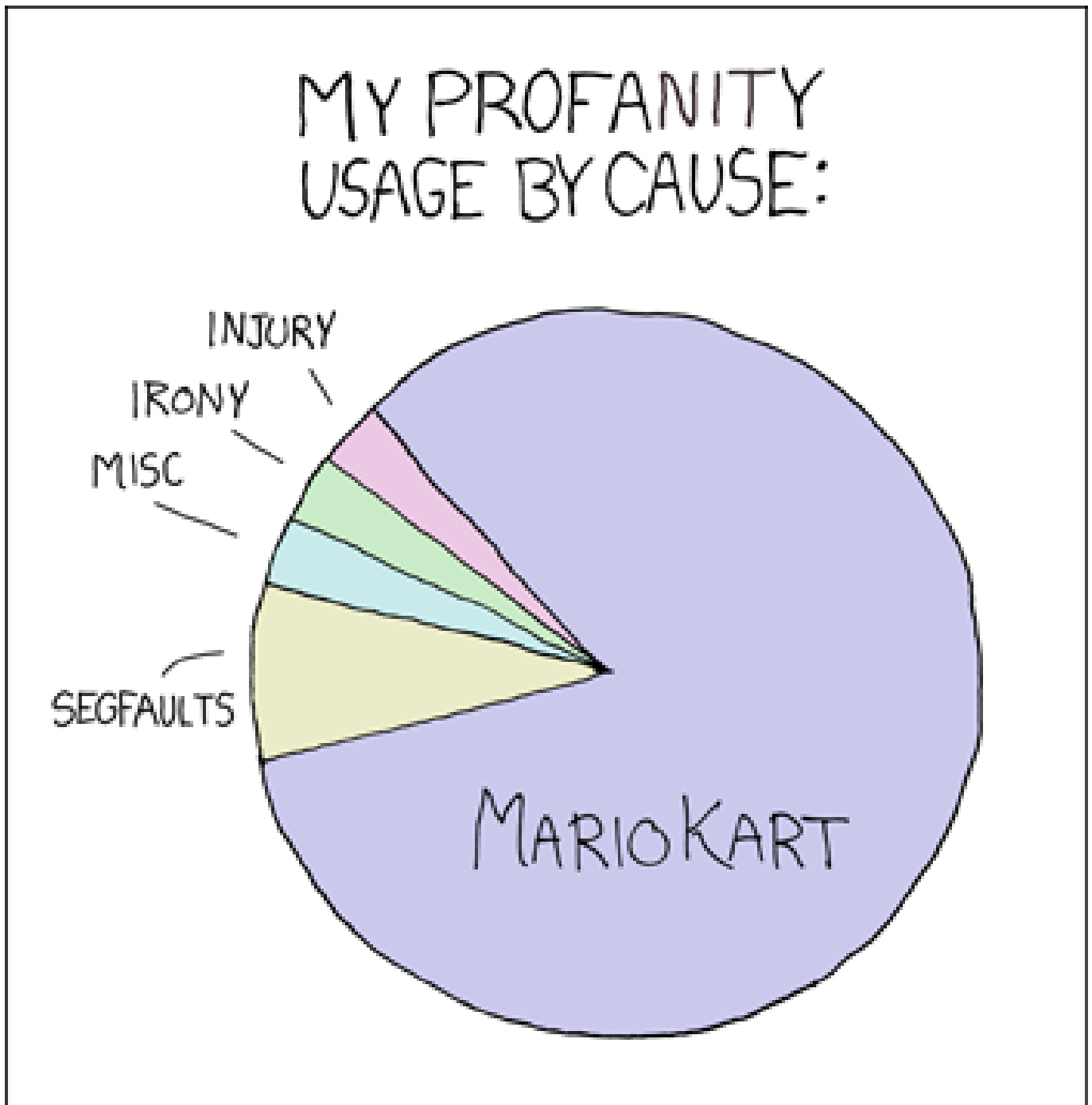
Worries assuaged, the numbers become less important than your touches.

### Explanation:

Cueball is making love with Megan but, like many highly introverted people, his attention is split between his inner and outer worlds. Part of his mind is counting her touches, and another part is wondering why his brain does these things, automatically and without his wanting it to. This worries him, and he feels guilty because he isn't giving her his undivided attention, which he believes she deserves.

As he unwillingly counts her touches, he recognizes the Fibonacci sequence, which starts with 1, 1, 2, 3 and 5. This recognition shocks him: it's like she knows what is going on in his head, and she sends him this signal to tell him that it's okay and that she understands. Awestruck, Cueball is reassured and glories in her love.

The title text makes it clear that he is able to stop worrying about the counting and that he is able to let it continue just in the background. It doesn't stop, but it isn't nearly that important or salient as the touching done by Megan.



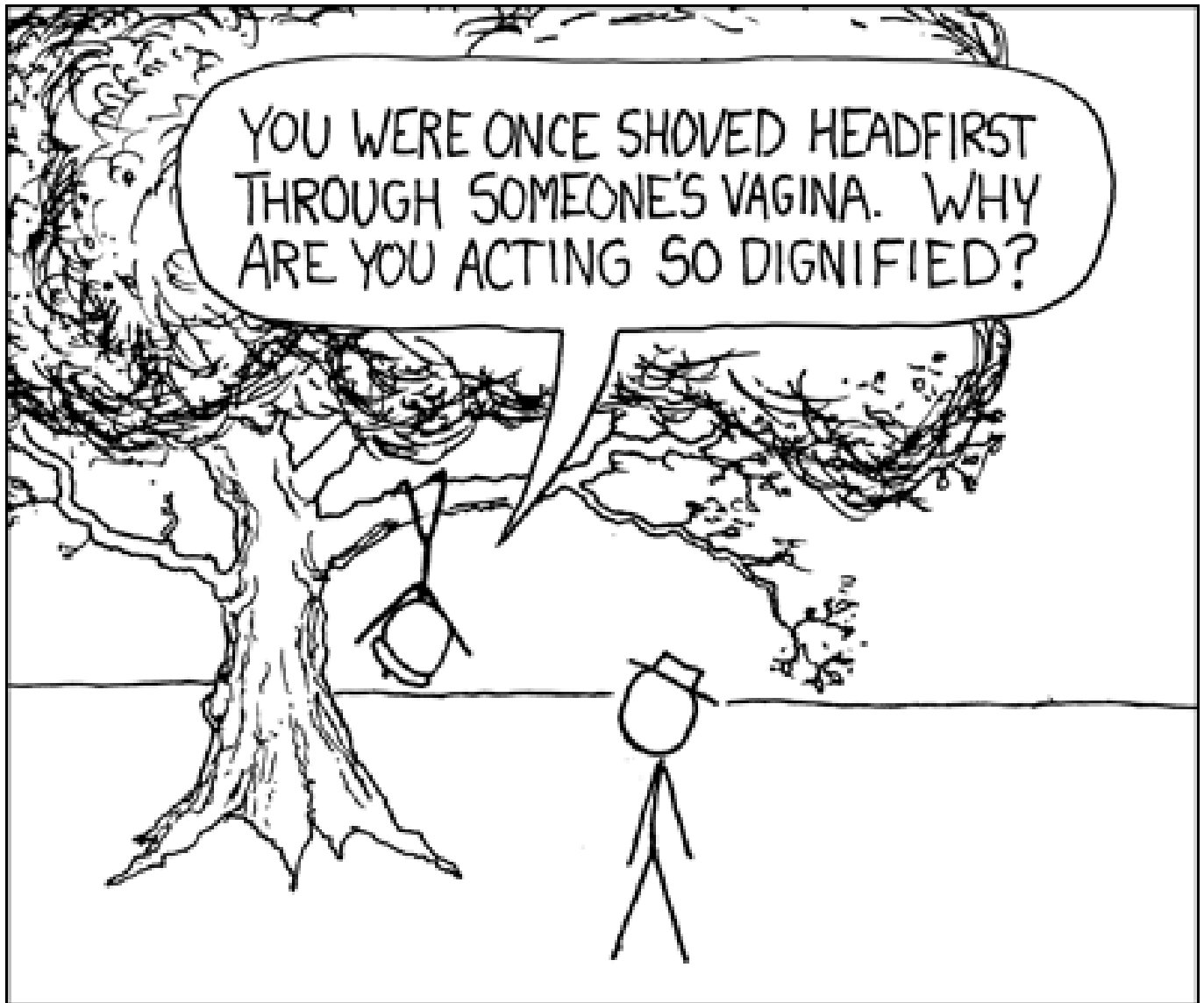
You can evade blue shells in *Double Dash*, but it is deep magic.

### Explanation:

Sometimes, something suddenly goes wrong, and you can only shout obscenities at it. For instance, when the dog bites, when the bee stings, when I'm feeling sad, or a program crashes (e.g. a segfault), the victim often reacts by swearing.

For Randall, however, profanities are caused mostly by blue shells in the video game *Mario Kart*. The blue shells, when fired, target the player currently in first place and stop them cold. In a close game near the end of the race, a player can go from first to an unrecoverable last in one hit.

The title text refers to Mario Kart: Double Dash. This includes a technique to avoid being hit by a blue shell, but it requires skillful timing to accomplish. The term "deep magic" comes from computer programmer slang. Interestingly, with a boost mushroom in Mario Kart Wii and Mario Kart 8 (and the so-called "Super-Horn" in the latter), it is also possible (with accurate timing) to escape blue shells.



'I don't know, why is your beret staying on your head?' 'Staples.'

### **Explanation:**

Beret Guy is hanging upside down in a tree, usually something you might have done in your childhood. As an adult, it is not considered very dignified. Most likely, White Hat made a comment on this and the fact that Beret Guy has his head down. But then, Beret Guy gives him an answer, regarding where White Hat's head once came through and asks him why he is still acting so dignified.

Here, Beret Guy is referring to the process of childbirth. Put in the way he mentions said process, the fact that White Hat came into this world in such a fashion would be very humiliating.

In the title text, White Hat replies that he does not know, but then continues to ask why Beret Guy's beret stays on his head, even when upside down (in which gravity would tend to make a beret fall off). Beret Guy explains that he has stapled the beret onto his head.

Such a process is similar to that of closing a wound after major head surgery, using surgical staples. Normally, the stapling of the head would be conducted with anesthetic and removed after the incision has healed, and only an insane person would do this to himself.[citation needed]

Doing this the way Beret Guy did it would be very, very, painful, and likely a bad idea.[citation needed]

Beret Guy is never seen without his hat (although it has been hidden under a green helmet once in 769: War). And later in 478: The Staple Madness, it turns out that he likes to staple anything to everything, so maybe he also stapled his hat to his head. The staple madness comic may very well be a sequel to this comic 262: IN UR REALITY, where Black Hat implied that he had stapled stuff to cats in the title text.

This also means that White Hat was not born by C-section.

In the teaser trailer of Indiana Jones And The Last Crusade, Indy staples a hat to his head (or at least pretends to) to prevent it from blowing off, a similar situation to the one Beret Guy is in here.

## #292: goto



Neal Stephenson thinks it's cute to name his labels 'dengo'

### Explanation:

Goto is a construct found in many computer languages that causes control flow to go from one place in a program to another, without returning. Once common in computer programming, its popularity diminished in the 1960s and 1970s as focus on structured programming became the norm. Edsger W. Dijkstra's article "Go To Statement Considered Harmful" in particular contributed to the decline of goto.

Often, people learning programming are told that goto is bad and should be avoided, but frequently, they are not given a good reason. Cueball, as one of these people, sees no harm in using goto to avoid rewriting much of his program, most likely written in the C programming language. As a result, he is attacked by a velociraptor. Velociraptor attacks are a running joke (and fear) often expressed in xkcd.

The name `main_sub3` of the goto destination also shows bad programming style: it is an unmeaningful name suggesting that at least two similarly unmeaningful names are used for other goto marks and it is contradictory in that a chunk of code can either belong to the main program or to a subroutine, but not both.

The title text refers to Neal Stephenson, an author of cyberpunk novels. A label is used in many programming languages to refer to a point in a program that a goto instruction (or other flow-control statements) can jump to. The joke is that one of Stephenson's characters in *Cryptonomicon* is named Goto Dengo. When said out loud, "Dengo" sounds like "Then go."

HELLO, 911? I JUST TRIED TO TOAST  
SOME BREAD, AND THE TOASTER GREW  
AN ARM AND STABBED ME IN THE FACE!

DID YOU READ THE  
TOASTER'S MAN PAGE FIRST?

WELL, NO, BUT ALL  
I WANTED WAS—



Life is too short for man pages, but occasionally much too short without them.

**Explanation:**

The title RTFM is an acronym for "read the fucking manual," which frustrated software manufacturers tell users when confronted with a simple question (most likely answered in the manual).

However, Cueball encounters a similar situation with a 911 call (the emergency number in the US), in which the first question the 911 dispatcher asks is if Cueball has read the toaster's man page (man pages are the 'manual' for unix systems, but only describe commands and library functions, not hardware). Even if a man page existed, it is unreasonable to require the user of a toaster to read the manual simply to avoid being stabbed in the face.[citation needed] The 911 dispatcher decides that as Cueball has not read the man page, he is not entitled to medical assistance, and so hangs up.

As such, the comic is satirizing people who respond to requests for advice for unclear, complicated tools with references to esoteric documentation rather than any help.

The title text refers to the popular phrase "Life's too short," which asserts that because we only have a limited amount of time on Earth, and that time can pass by quickly, we should make the most of it. That could mean, for example, don't spend time reading the documentation unless you actually experience a problem. The second part suggests that some people actually die because they didn't RTFM!



## #294: Bookstore

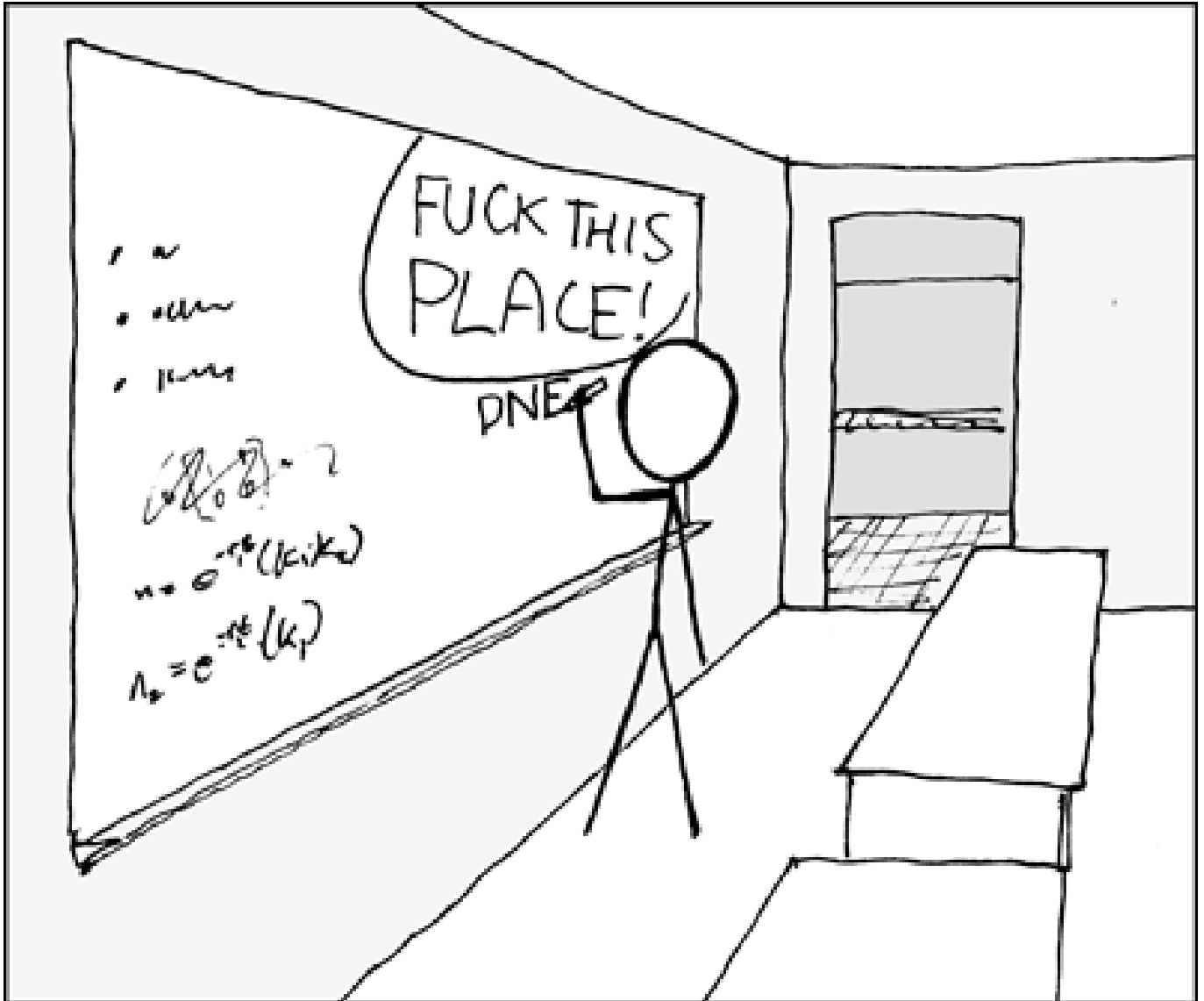


You can search it if you want, but you may want to skip the memories of your mom.

### Explanation:

Cueball starts reading a book off the shelf as he considers buying it, but gets so engrossed in it that he accidentally reads the entire thing, eliminating his reason for buying it in the first place. He quietly puts it back and turns to leave the store, only to have the book (which exists in his brain as information) set off the store's anti-theft sensor. This is a satire of copyright as it pertains to digital copies, because when you download a game or music file (or read a book, in this case), you are merely making an identical copy of the source material.

The title text suggests that if the security guard wants to do a brain search, he might want to skip over all the presumably sexual encounters Cueball has had with the security guard's mom, thus inducing a 'yo mama' joke.



I've seen advertisers put their URLs on chalkboards, encircled with a DNE. They went unerased for months. If you see this, feel free to replace the URL with [xkcd.com](http://xkcd.com).

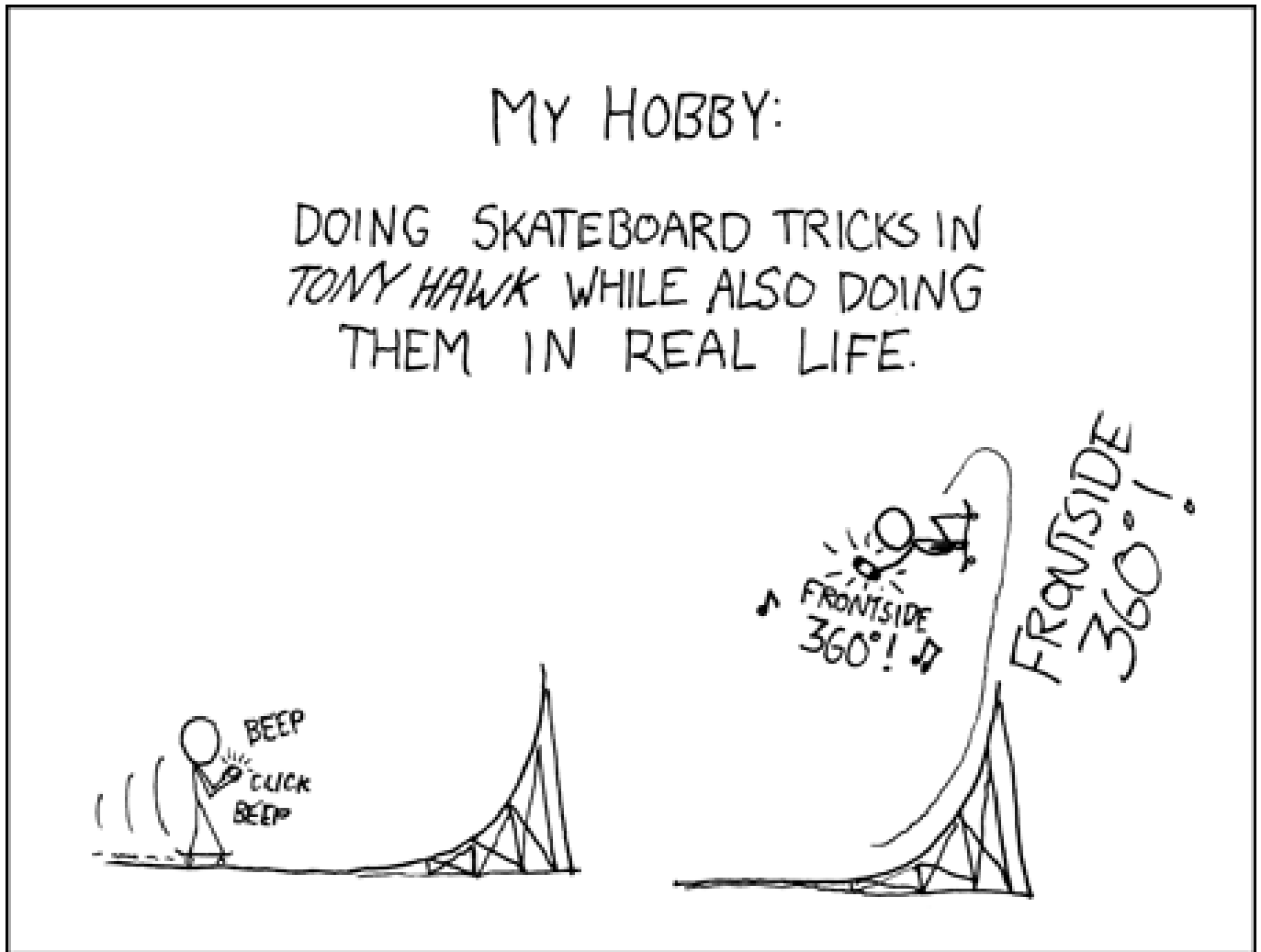
### Explanation:

DNE stands for "do not erase," and is commonly used on school whiteboards to let the sanitation staff and other teachers know not to erase that particular area of the board. DNE circles often encompass important information such as test dates or the teacher's name.

It is easy to see how leaving things marked with DNE can become automatic for anyone often erasing boards, so that they don't notice what the message actually says, or reflect on whether the DNE-marking is reasonable for it. Cueball's dissatisfactory note is not very subtle, but Randall notes in the title text that advertisers have successfully used the same tactic for less conspicuous URLs to their sites. He also kindly asks you to replace those messages with [xkcd.com](http://xkcd.com) to get some free advertising.

On the bottom half of the board is a crossed out 2x2 matrix and two functions for exponential decay.

## #296: Tony Hawk



Bad idea #271: Dropping into the half-pipe on a Segway.

### Explanation:

Cueball is seen using a hand-held game system, while on a skateboard. He is playing one of the many Tony Hawk titles in which you control a skater and perform tricks to gain points and achievements. While playing the game, he wants to simultaneously perform the trick in real life, both because it is exceptionally difficult to do both and because the game will give him praise when he does a trick successfully.

In the title text, Randall describes his Bad Idea #271: Dropping into the half-pipe on a Segway.

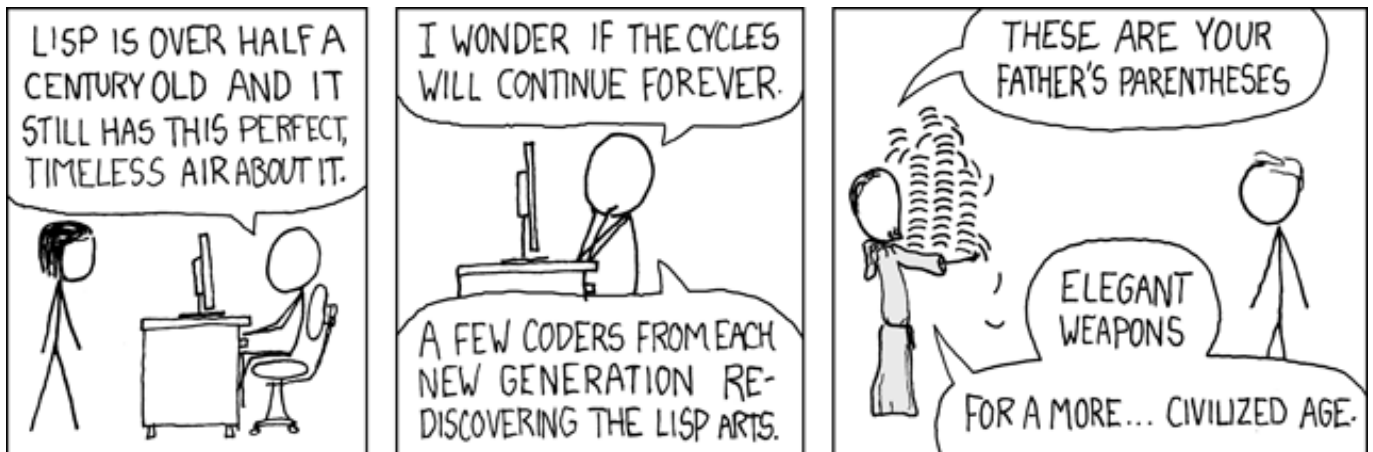
One imagines this would result in the Segway becoming unstable and going completely crazy, hence one would classify it as a "bad idea."

Which is surprisingly not the case; it even looks quite fun.

The Segway engineers obviously foresaw this situation and implemented the Segway controller with its tilt sensors accordingly.

17 years later Tony Hawk became a physics professor in 2967: Matter.

## #297: Lisp Cycles



I've just received word that the Emperor has dissolved the MIT computer science program permanently.

### Explanation:

Lisp is one of the oldest high level programming languages. Despite being significantly ahead of its time, it never got enough traction outside of academia, and has never been widely used. However, it is considered to be a very powerful language even in the present day. Quotations regarding Lisp show that several big names in computer science and the tech industry hold Lisp in very high esteem. Eric S. Raymond goes as far as to say

Lisp is also famous for its use of fully parenthesized Polish prefix notation. As a result, Lisp programs take the form of enormous nested lists bounded by parentheses, and it is not uncommon to see the source code of a large Lisp program close off with an equally enormous stack of close-parens, representing the simultaneous termination of dozens of recursively and hierarchically nested functional and procedural structures.

In the first panel, Cueball praises Lisp, observing that no other language can match the awe that it still strikes despite its significant seniority.

In the second panel, Cueball proposes that new programmers might continue to learn Lisp forever; despite the language's lack of widespread adoption, a small cadre of hackers will always exist who keep the language alive.

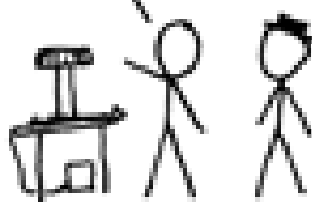
The third panel references Star Wars. The "old wizard" Obi-Wan Kenobi, who remembers the culture and sophistication of the Old Republic ("Before the dark times. Before the Empire.") and lives as a hermit in the desert at the beginning of the film spoke these lines when passing on a lightsaber to Luke Skywalker:

The title text is also a reference to Star Wars lines:

The MIT mentioned in the title text is, of course, the Massachusetts Institute of Technology, an institution fundamental to the development of Lisp (and Scheme, which is a dialect of Lisp). For about 20 years, MIT taught Scheme in its introductory computer science course, 6.001 — Structure and Interpretation of Computer Programs (that course has since been replaced with a course teaching Python).

## **#298: Tesla Coil**

I FINALLY  
FINISHED MY  
TESLA COIL!



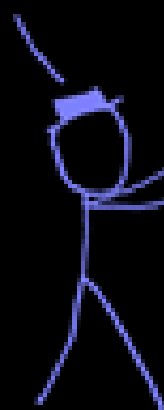
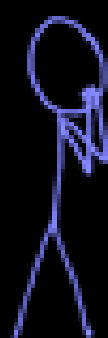
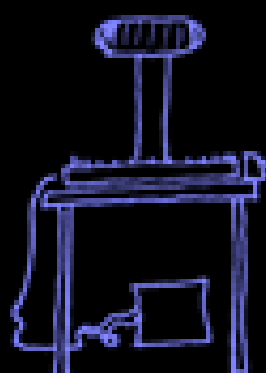
GZZZZZZ



COOL,  
BUT—

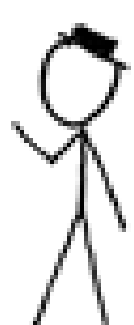
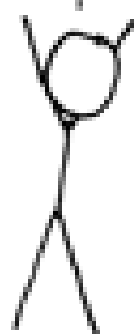
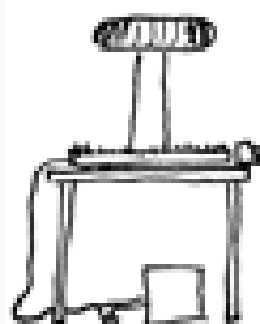


CHECK THIS  
OUT!



GZZZZZZ

HOW DID YOU  
DO THAT?



THE WORLD DOESN'T  
ACTUALLY MAKE SENSE.  
SCIENCE DOESN'T WORK.  
NO ONE TOLD YOU BECAUSE  
YOU'RE SO CUTE WHEN  
YOU GET INTO SOMETHING.

STILL, NEAT TOY.



For scientists, this can be the hardest thing about dreams.

**Explanation:**

Cueball diligently creates a Tesla coil, a device that produces high voltage alternating currents.

After that show by Cueball, Black Hat magically shoots electricity from his fingertips. When Cueball asks how he did that, he says that science doesn't really work, then hovers in mid-air, further proving his point. There is simply no apparent explanation for Black Hat's abilities, which means science is still woefully incomplete or, as Black Hat said, simply doesn't work.

Black Hat further explained that the reason that nobody told Cueball was because they thought he was "cute when [he] got into something". Implying that everyone else also knows, and only Cueball was clueless.

The title text indicates that this was all actually a dream, explaining Black Hat's abilities and pointing out how dreams can be difficult for scientists as they will attempt to analyze and understand everything in the dream according to the laws of science, which wouldn't apply in dreams.[citation needed]

## #299: Aeris Dies



It's bad enough that all the families in your Sims are just you and Maggie recreated over and over.

### Explanation:

From the looks of this comic, there is a friend here who had a loved one (named 'Maggie') who died. Maggie is likely a spouse or girlfriend, but could also be a mother or another significant relation. Cueball tries to help him by comparing his plight to a significant plot point in the popular game Final Fantasy VII for the PlayStation 1 in 1997, the plot point being the permanent death of Aerith Gainsborough (originally translated as "Aeris"), the last of a race called 'the Ancients' and a potential love interest of the main character of the game. Although technically being a spoiler due to its significance and dissonance to the plot, Aerith's death became one of the most iconic video game scenes of all time, leading to its referencing and even parodies throughout the game community.

The word 'permanent' was not meant for redundancy in the last paragraph; the developers wanted to symbolize how death is unexpected, leaving you with an empty feeling, filled only by regret.[actual citation needed] Therefore, when they received word about how much people wanted Aerith to be brought back to life, they felt that they succeeded with evoking the right feelings with her death. Even so, due to all the significance her death brought, the developers refused to officially resuscitate her.

That did not stop other people from modifying the game in order to unofficially resuscitate her, though.

Cueball feels really troubled that his friend would take such a course of action (especially with a fictional character, admittedly) instead of dealing with her death. His friend takes this to more disturbing levels, wanting to 'mod' Cueball with Maggie's clothes, turning Cueball into a 'substitute Maggie.'

The title text references The Sims, a series of life simulation games where you can create virtual people (the aforementioned Sims), set their appearances, and essentially mess around with their lives. Cueball notes that his friend already attempted to 'recreate' Maggie and him (repeatedly at that) using the simulation abilities in the games of his The Sims series.



## **#300: Facebook**

# MILDLY SLEAZY USES OF FACEBOOK, PART 14:

LOOKING UP SOMEONE'S PROFILE BEFORE  
INTRODUCING YOURSELF SO YOU KNOW WHICH  
OF YOUR FAVORITE BANDS TO MENTION

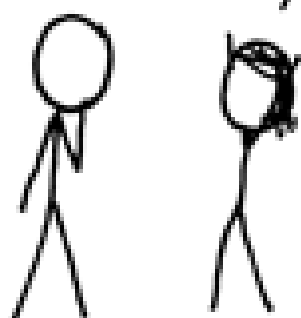
FAVORITE BANDS? HMM...  
MAYBE REGINA SPEKTOR  
OR THE POLYPHONIC SPREE.

WHOA, THOSE ARE TWO  
OF MY FAVORITES, TOO!

CLEARLY, WE SHOULD  
HAVE SEX.

OKAY! MY FAVORITE  
POSITION IS THE  
RETROGRADE WHEELBARROW.

OHMYGOD, MINE TOO!



'Here, I'll put my number in your cell pho -- wait, why is it already here?'

### **Explanation:**

This comic approaches how Social networks have changed the ways of human interaction. With everyone placing their personal interests on their Facebook profile pages, it has become fairly easy to gather a lot of information about people. In the comic, Cueball uses this information to his advantage: He ascertained Megan's musical preferences beforehand in order to create the illusion of their sharing mutual interests. Megan is led to believe that he is like-minded, thus making it easier for Cueball to persuade her into having sex with him. Here the comic takes at the fact that many people use Facebook as a hunting ground for sexual contacts.

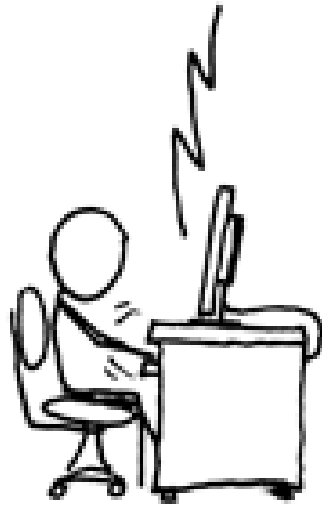
Apparently, Megan did not only mention her favorite bands in her profile, but also her preferred sex position. This can be read as a sideswipe at what intimate details some people are willing to share on the internet. Although mentioning sexual preferences is hyperbolic here.

Megan's taste in both fields can be regarded as outside the mainstream. Regina Spektor and The Polyphonic Spree are representatives of the indie pop genre. The Wheelbarrow (NSFW) features the man standing behind the woman and holding her legs, while she props up in a wheelbarrow-like position. The retrograde variant has the woman facing upwards. Unusual sex positions are also mentioned in comics 414: Mistranslations and 487: Numerical Sex Positions.

The title text suggests that Cueball did not stop at reading Megan's interests on her Facebook profile, but also obtained her phone number and placed it in his phone. It is implied that some of the "mildly sleazy" uses of Facebook can border on the verge of stalking. When Megan discovers the number, she may realize this and stay clear of Cueball...

### #301: Limerick

I USED TO FIND SLASHDOT DELIGHTFUL,  
BUT MY FEELINGS OF LATE ARE MORE SPITEFUL;  
MY COMMENTS SARCASTIC  
THE ICONOCLASTIC  
KEEP MODDING TO PLUS FIVE (INSIGHTFUL).



Fun game: try to post a YouTube comment so stupid that people realize you must be joking. (Hint: this is impossible)

#### Explanation:

A limerick is a well-known type of poem that is usually humorous or bawdy. Technically, a limerick is primarily anapestic trimeter: each line contains three "feet," each foot consisting of two unstressed syllables followed by a stressed syllable. The rhyme scheme is AABBA: the first, second, and fifth lines rhyme, as do the shorter third and fourth lines. Almost anyone can instantly recognize a limerick after hearing the first line.

Slashdot is a venerable techie site. On many sites, the user base can vote comments "up" or "down," but at Slashdot, only moderators (these are randomly drawn from the pool of registered users) may up or down vote comments, and the moderator may select a reason for their up or down vote. Instead of a simple +1, a comment may be voted +1 (Funny). Similarly, instead of -1, a comment may be voted -1 (Off-topic). +5 is the maximum positive score. A comment rated +5 (Insightful) has been upvoted at least 5 times, and has a plurality of "Insightful" votes.

Cueball's limerick says that he does not like Slashdot anymore, because his sarcastic

comments are being treated as "insightful" by the very people he's being sarcastic to.

The title text refers to the notoriously awful comments on YouTube, many of which are so idiotic that they're interpreted as jokes.

In both cases, Randall is invoking Poe's Law. Both sites have become so full of extremes that you can no longer mock the extremists without looking like a sincere extremist yourself.

301, the number of this comic, is also a number often associated with YouTube. At the time this comic was published, view counts on YouTube videos would often freeze at 301, as YouTube would switch between view-counting algorithms when the number of views exceeded 300. Therefore, the comic number itself may be a reference to the title text.

## #302: Names



I'm always so happy that I successfully navigated the introduction that I completely forget to pay attention to the name the other person told me.

### Explanation:

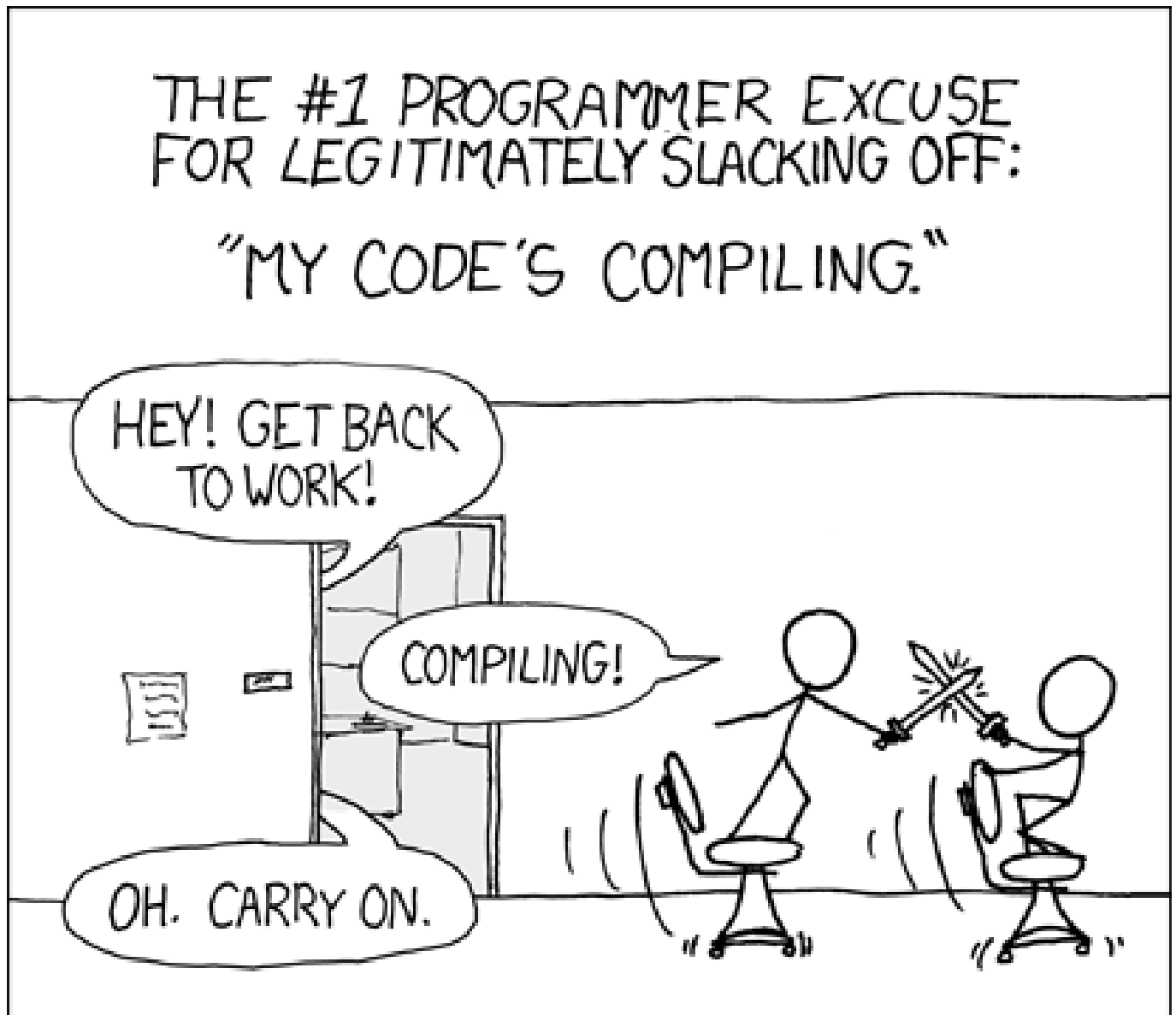
Everyone has had moments where they forget someone's name, even the name of someone pretty important. This doesn't often happen with one's own significant other, however, hence the joke.

Cueball has been in a relationship with someone but does not know his girlfriend's name. He knows that the relationship has progressed to the point where asking for her name would be awkward and impolite, and so he waits for someone to call her by name. Cueball is excited when one finally does, only to reveal that they are in the middle of a wedding ceremony. It is hard to be in a relationship with someone if you don't know their name, and for said relationship to progress to the point of a wedding is simply incredulous.[citation needed]

The title-text talks about how it's sometimes tricky to say the right things during an introduction, and while making sure you don't make an incorrect response (replying to the question "How're you doing?" with "Not much," for example, mishearing the question as "What are you doing?"), one can sometimes forget to pay attention to the actual important part of the introduction: the person's name. And it's awkward to ask someone for their name when you should, by all rights, already know it.

Forgetting people's names is a frequent symptom of various social anxiety disorders, but it can happen to anybody at any time.

This comic may have been inspired by this SMBC comic.



'Are you stealing those LCDs?' 'Yeah, but I'm doing it while my code compiles.'

### Explanation:

Computer programming involves writing instructions for a computer to follow, in a specific programming language, which is largely human readable and writable, at least to programmers who understand that language. However, for the computers to follow instructions, they need to be given machine code — the actual "language" that computers "speak" and one that can be written directly with the correct tools, but would be too tedious and error-prone for just about any practical modern project where alternatives exist, where anything more than a Hello World could be awkward to implement straight into machine-code.

Conversion from the more conveniently human-writable code into computer-executable files is performed by assemblers, interpreters, or compilers.

Programs can be written in assembly code, which is basically just a set of mnemonics that make machine code much easier for a human to remember and correctly parse; the

human-written assembly code is then run through a simple assembler to convert it directly into machine code. Assembly coding is necessary whenever one is programming for a completely new architecture (one for which no other tools yet exist), and is still used in some other situations (as it allows the code to be optimized more closely for the system on which it is to run than is possible with other types of coding), but is still fairly tedious and error-prone, and assembly code needs to be completely rewritten if one wants to port it to a computer with a different architecture.

An interpreter (e.g. that for PHP for one example) generally reads through the code, or script, each line at a time as and when required, and has to do a lot of work with various processing overheads and the risk of hitting an invalid instruction or mistake in syntax that it can't handle. It also requires that a relevant version of the interpreter exist on any machine that has to run the script and perhaps some additional knowledge by the end-user.

For widely distributed (and especially commercial) programs, some form of compilation will instead be used. Compiling may have just one computer system read through the human-written code and (barring errors) produces the equivalent stand-alone and direct machine-readable code, suitable for a given range of computers. This process might involve several passes to check for 'obvious' errors in the code, as well as converting some programming concepts that are easiest for humans to understand into equivalent concepts that may be far easier for the computer to work with.

As such, compiling takes a certain amount of time at the time of production. Normally, this takes a few seconds, but, depending on the size of the project and the power of the computer doing the compilation, the time required to compile a program may measure in minutes, or even hours. As of 2015, the Linux Kernel contains over 19 million lines of code, arguably a massive job for any compiler, but if done correctly, it saves time for all the people who will ultimately be using its output.

Thus, when Cueball is caught wasting time at work, he argues that such activities are not worse than any other possible ones, at this moment. If his job is writing code and compiling it, then there may be nothing else that he can do right now. He cannot usefully tweak the code before it finishes compiling and the expected result checked.

The title text takes this a step further. Cueball claims that all activities are equally benign while the code is compiling — and that includes committing illegal acts, such as stealing LCDs.

Nine years after this comic was released, Randall made a comic called 1755: Old Days about how compiling worked in the old days. It was Cueball who asked. The next comic after that, 1756: I'm With Her, was released the Monday before the 2016 United States presidential election. And in that comic, a Cueball with a sword on an office chair like in this comic is featured. It seems realistic that Randall had that politically loaded comic ready for some time, and when finding and deciding to use this old version of Cueball, he may have been inspired by the compiling theme to make Old Days.

Nearly seventeen years after, it seems that the Quality Assurance department had possibly appropriated a whole day of 'enforced downtime' for 2928: Software Testing Day. Assuming that the arranged testing goes as planned.

Soon after, many computer users had another day off due to a glitch in CrowdStrike that causes early-boot BSODs.



## **#304: Nighttime Stories**



FOR A FEW WEEKS NOW,  
SOMETIME PAST MIDNIGHT,  
A GIRL HAS WANDERED  
PAST MY APARTMENT  
READING BY FLASHLIGHT.



I WONDER IF SHE LETS ANYONE  
INTO THAT ISLAND OF LIGHT.

Cue angry letters from all seven fans of *Xenocide*.

### **Explanation:**

Cueball observes Megan walking around at midnight, reading a book that he can't see. Curious, he leaves his apartment to ask her what she is reading. It is revealed as Orson Scott Card's *Xenocide*, the third book in the *Ender's Game* series following *Ender's Game* and *Speaker for the Dead* (and since followed by several other books). *Ender's Game* has been covered in other xkcd comics like 241: Battle Room and 635: Locke and Demosthenes, which cover events in the first book.

*Xenocide* is regarded by fans as one of the weakest books in the series, while *Ender's Game* and *Speaker for the Dead* received extreme positive praise. When he discovers that she likes *Xenocide* more than the other two books, he instantly withdraws to his apartment, his opinion of her shattered. So far as Cueball is concerned, *Xenocide* is so clearly inferior that he could not be with anyone who 'wrongly' considers it to be the best of the series. This pokes fun at people like Cueball who have such strong opinions on books like *Ender's Game* that they could never get along with anyone who disagreed.

The title text pokes further fun at *Xenocide* by saying that there are only seven people in the world who would defend it, a laughably small number.[citation needed]

## #305: Rule 34



Okay, Lance. For entry into the college bowl, spell 'Throbbing'

### Explanation:

Cueball is rather surprised to find slash fiction (same-sex erotic fiction featuring characters from popular media, often from unrelated series) featuring characters from the Thomas the Tank Engine television series, but Megan isn't remotely surprised, citing Rule 34: "If it exists, there is porn of it. No exceptions."

Cueball denies the truism of the rule, coming up with several examples of porn that doesn't exist yet, until he comes across one that they both agree would be pretty hot: Women playing electric guitar in the shower. Megan proceeds to get ahead of the curve by registering WetRiffs.com.

By doing this, Megan invoked Rule 35, an additional rule based around rule 34. Rule 35 states: "If there is not porn of it, porn will be made of it."

In the title text, we can assume that the presenter in a spelling bee is asking a male participant with the name "Lance" to spell "throbbing," a term sometimes used to describe the swelling of a person's genitals. The scene thus plays out like the start of a hypothetical homoerotic spelling bee that could contain rude words or innuendo.

Rule 34 is mentioned in the title text of 505: A Bunch of Rocks and 860: Never Do This.

## #306: Orphaned Projects



His date works for Red Hat, who hired a coach for her, too. He advised her to 'rent lots of movies like Hitch. Guys love those.'

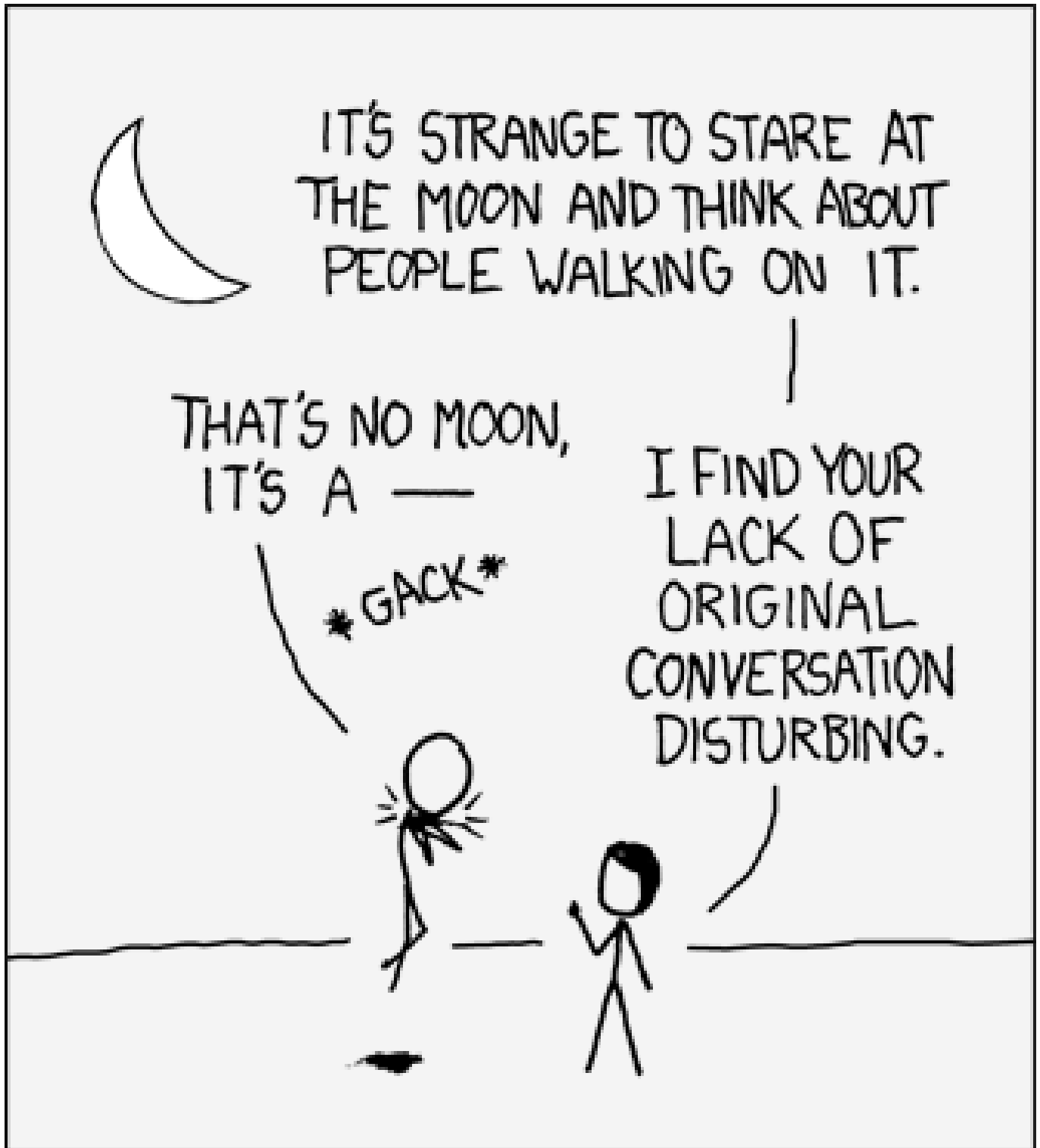
### Explanation:

Debian is a GNU/Linux distribution (but also ships GNU Hurd and BSD versions).

The comic is about orphaned Linux projects, because volunteer FOSS developers will often leave their projects aside whenever something of greater importance to them requires more time (like dating, relationships, tiredness, sickness, boredom, natural disasters, wild boar attacks, zombie apocalypses, robot uprisings, desire for snacks, etc.). Some companies/foundations, while not needing these developers, can greatly benefit from community-maintained projects. The Debian Team uses a phrase that is, intentionally or otherwise, similar to the famous Yoda quote from Star Wars: Episode I – The Phantom Menace in the first panel "Fear leads to anger. Anger leads to hate. Hate leads to suffering," by replacing it with dating and orphaned projects.

Hitch is a romantic comedy in which Will Smith plays a "dating coach," who helps men to have successful dates with women. To avoid losing their developers (in this case, Cueball), the people at the "Debian HQ" have opted to hire Black Hat to give the developer intentionally bad dating advice, thus sabotaging his relationship before it could become distracting. Cueball is advised to "constructively criticize" his date in an attempt to appear more intelligent. This technique is very unlikely to work,[citation needed] but is nonetheless attempted by some men. It is unclear whether this is "negging" (See 1027: Pickup Artist) or simply a demonstration of hubris, neither of which would be an attractive attribute in a potential long-term partner or mate.[citation needed]

In the title text, the woman is being similarly advised by a representative hired by Red Hat. Red Hat is the company behind Fedora Linux and RHEL. She is advised to rent lots of romantic comedies, presumably to watch with her date. The prevailing stereotype is that young men strongly dislike films in that genre.



Unfortunately for her, real Star Wars fans are attracted to a gal with a good force choke.

### Explanation:

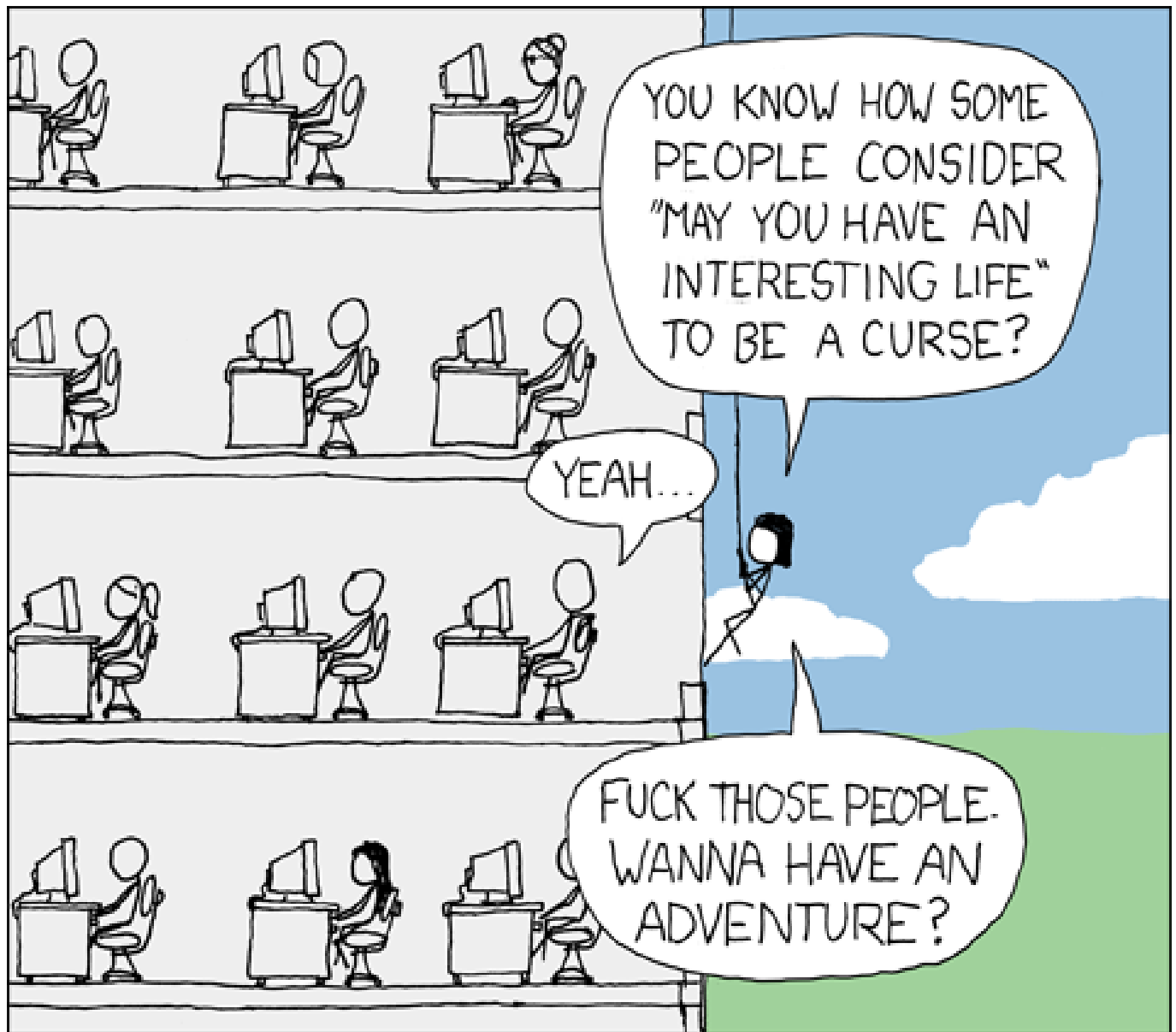
Megan just wants to have a normal conversation about the moon, but Cueball replies with a quote from Star Wars: Episode IV – A New Hope, wherein Obi-Wan Kenobi says: "That's no moon, that's a space station." Megan cuts him off in the manner of another Star Wars character, the villain Darth Vader, and showing a glimmer of the

character's abilities, proceeds to choke him with The Force while modifying another phrase from the same film. (The original quotation was, "I find your lack of faith disturbing.")

There is humor in Megan's hypocrisy, however. Although she is disturbed by Cueball's unoriginal dialogue, she is fine with doing it herself. (It is possible, however, that she finds modifying a quote, rather than just repeating it verbatim, to be original enough.)

Star Wars fans are a weird bunch, however, and the title text states that if a Star Wars fan met a girl who could do this in real life, it'd only serve to turn him on even more.

## #308: Interesting Life



Quick, fashion a climbing harness out of cat-6 cable and follow me down.

### Explanation:

'May you live in interesting times' (or, in this comic, 'may you have an interesting life') is supposedly a Chinese saying, except that a few people (usually the worst-case-scenario kind) believe it to actually be a curse, even though it is usually meant in a good way when said. The quote also provides the title of the Terry Pratchett novel *Interesting Times*, which takes place in a fictional counterpart of China.

Cueball is shown here as an office worker, a job that, to most people, is the opposite of interesting. This is contrasted with Megan, who is rappelling down the outside of his office building, for no apparent reason other than because she can, and inviting him on an adventure. This contrast is amplified by the usage of "interesting" colors for the outside in comparison to the "dull" gray for the inside of the building. Things are bound to get at least one kind of "interesting" very fast.



The title text refers to a Cat6 cable, which is more commonly known as Ethernet cable. It would be easily found in an office building, since it is used to connect computers to a network. Its usefulness as a climbing harness is indeterminate.[citation needed]



I am never going out to buy an air conditioner with my sysadmin again.

### Explanation:

Randall is comparing the ways different people look at choosing between similar products. In the first example, which Randall considers "bad," two "non-nerds" look at two products (without a description of any kind) and instantly decide which one they want. In the second example, which is considered "good," one of the two is a nerd, and the other one is a non-nerd. The non-nerd instantly picks one of the products, but the nerd evaluates the two and decides that the other one is better because it's a better deal. In both the first two cases, the pair is able to easily come to a decision.

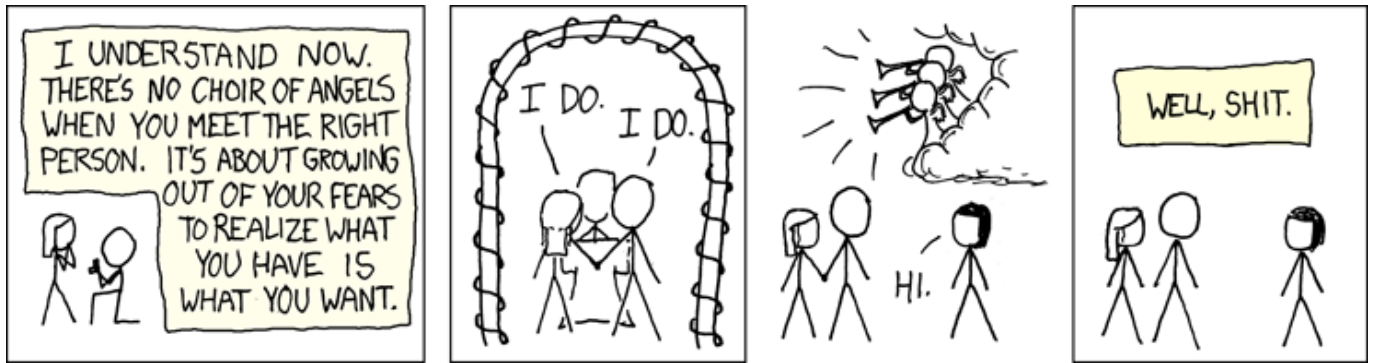
However, in the third example, two nerds are comparing the two boxes, and both of them overanalyse the various merits and drawbacks on each of the two boxes. They are still there two hours later, unable to reach a clear agreement on which of the two boxes they wish to buy. One nerd comments that their definition of value is unclear, suggesting that the discussion has gone on for so long because they are re-evaluating their definitions over something too trivial. Some might perceive this as typical "nerd" behaviour, overanalysing a problem that is in actual fact quite trivial, such as the

decision whether to buy one box or the other virtually identical box. The non-nerd woman from the second situation (or perhaps the store manager in this situation), who has watched the two nerds compare the two products for hours, attempts to put this into perspective by pointing out that an unclear definition of value is not their main problem. The implication is that their real main problem is that they are unable to reach an agreement on something that makes so little difference. Or their problem could be the one described in 1445: Efficiency.

The title text suggests that Randall entered a similar situation attempting to buy an air conditioner with his sysadmin, short for System administrator. The sysadmin is a person in an organization employed to manage the computer system or network, a role that requires technical skills and intelligence. The suggestion here is that a computer programmer, like Randall, put together with a sysadmin, would spend as much attention to detail as the two nerds in the comic, laboring over which of two trivially similar products to buy.

Randall deals with sysadmins again in 705: Devotion to Duty.

### #310: Commitment



Could be worse. The last guy in that situation fell for one of the transient trumpeting angels.

#### Explanation:

In the first panel, Cueball proposes to a woman. While he does this, a narrator (most likely the man's inner voice) explains why he wants to marry her. It's implied that he had doubts about their relationship. He'd never experienced a moment of overwhelming love and certainty, especially when they met, which he describes as a "choir of angels when you meet the right person." He's come to believe that such a scenario is actually implausible, and a serious relationship is about "realizing that what you have is what you want."

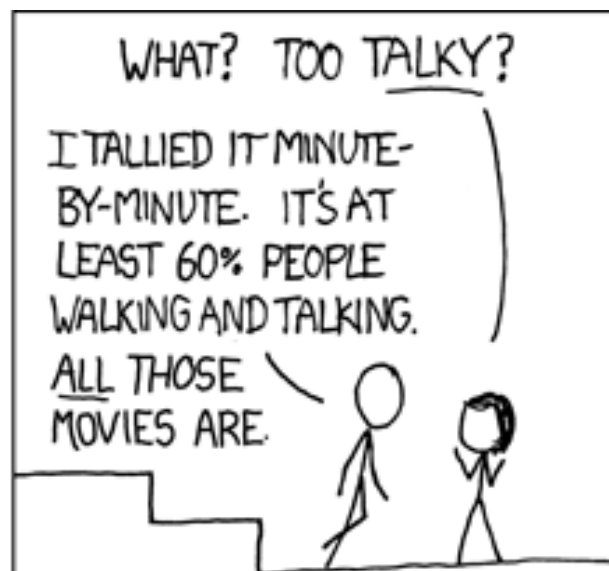
In the second panel, they get married. And in the third panel, after they are married, Megan comes in saying 'Hi.' His wife appears to still be wearing her wedding veil, implying that he meets Megan immediately after the scenario. Cueball has the full 'love at first sight'-experience, with a literal choir of trumpeting angels, suggesting that Megan is actually the one he's supposed to be with. That this realization strikes him immediately after he married someone else puts him in a very difficult situation. This is expressed by him thinking 'Well, shit.'

The title text notes that the previous guy who had a similar experience fell in love with one of the angels instead, not realizing that it was the girl he just met that was the love of his life. Which is of course much worse, especially because the angels are transient, and the only way to see them again is by meeting the perfect 'girl' and he has just ignored her! Alternatively, it could mean that that person was actually the last person to have such an experience, possibly because the persons succeeded in marrying and having children with the angel, resulting in offspring that were too powerful or otherwise undesirable. Something similar happens in Genesis 6:1–4, so this may be a reference to the Bible.

The humor of this comic plays upon a common anxiety in trying to build relationships. A person may be dating someone who they enjoy being with, but expect a moment of supernatural clarity announcing that they've found the right person to spend their life with. Most people never have such a moment, and have to build their relationships slowly, based on more prosaic considerations, like compatibility, commitment, and shared life goals. Frequently, people will build such a relationship, but worry that a magic and transcendent love is still out there, and if they 'settle' for the person they're with, they may find that love later and be unable to act on it.

The comic 584: Unsatisfied could be seen as a continuation of this - with the blond girl being depicted as Ponytail. It can also be seen as a deconstruction: in the subsequent comic, no matter which partner he chooses, he spends the rest of his life thinking about the other, apparently never being totally satisfied with the relationship he has.

## **#311: Action Movies**



By my count, only 48 of the 158 minutes in *Live Free or Die Hard* have action. That's pathetic, guys. *Crank* is better, but needs a bigger budget and more Summer Glau.

### **Explanation:**

A common complaint about action films is that they are light on plot and heavy on pointless violence and special effects. The *Die Hard* series (including *Live Free or Die Hard*) are typical action films about which this complaint has been made. However, Cueball reverses the complaint, stating that proportional to the run-time of the movie, there could have been much more action and much less plot. He takes this idea to an extreme, saying that his ideal action movie should have only half a minute of exposition and otherwise consist of nothing but one long, continuous action scene. Megan adds that starring a well-known and popular character - one that audiences "never get tired of watching" - would further eliminate the need for exposition and provide more time for action.

The two come up with "River Tam Beats Up Everyone" as such a movie. It is unclear whether this is the actual title of their proposed movie or simply a description or teaser. In either case, the name doubles as a more or less complete plot description. River Tam (played by Summer Glau) is a character from the popular but short-lived TV series *Firefly*. In the show, she is shown to have almost clairvoyant mental capabilities (including being able to read minds and aim a gun without looking), and the series largely revolves around a conspiracy concerning her. In the follow-up movie *Serenity*, River also possesses superhuman fighting skills - early in the film, triggered by a subliminal message, she unexpectedly begins attacking everyone in a bar. Later, in the film's climax, she subdues an entire squadron of Reavers while hardly breaking a sweat.

The poster art for "River Tam Beats Up Everyone" is almost certainly inspired by these scenes from *Serenity*, and Megan and Cueball's decision to use River is based on her rampant popularity among the *Firefly* fan base. The poster's typeface, Papyrus, has also been used in many of the marketing materials for both *Firefly* and *Serenity*; Randall would later confess his love for it in the title text of 590: Papyrus.

In the title text, Randall states that *Live Free or Die Hard* had far too little action and suggests another movie, *Crank*, as a better example. He goes on to suggest that *Crank* would have been better if it had had a larger budget and starred Summer Glau in a fighting role.





Some say the world will end in fire; some say in segfaults.

### Explanation:

This comic presents a poem about a god's dilemma of whether to create the world using Perl or Lisp, two popular computer programming languages. The god has chosen to write it in Perl, but since then appears to lament the choice, apparently expressing that if given the chance to write the world's code again, they would use Lisp instead. The poem and the title text are a parody of "Fire and Ice," written by the American poet Robert Frost and first published in 1920. In this poem, the speaker discusses his stance in the debate on whether the world will be destroyed in fire or in ice. "A God's Lament" has a rhyme scheme that is nearly identical to that of Frost's poem. However, it differs in that "Lisp" does not rhyme with "men," "again," and "paren," while the corresponding four lines in Frost's poem do rhyme. (That said, "Lisp" does have a near-rhyme in "myth" and "with," especially if you say "Lisp" with a lisp.)

The implication is that a universe created by Lisp would look better under close examination, the 'founding myth' referred to in the poem. Instead of an incomprehensible big bang, inflation, dark matter, and dark energy, the elegance of Lisp

may have led to more elegantly-framed laws of nature.

The grammar of Lisp as a language requires the programmer to use a multitude of parentheses and, in many cases, it can be difficult to determine whether all of the parentheses have been properly matched up to one another. The last two lines of the poem refer to the plentiful parentheses in Lisp, and the image at the bottom of the panel shows a close-parenthesis at the supposed end of the Universe. See 859: (.

A segmentation fault, also commonly called a segfault, is an error that occurs when a computer program attempts to access computer memory to which it should not have access. This is a fatal error that will cause the program to stop executing.

This comic deals with similar subject matter to 224: Lisp, in which one of "the gods" claims that although the Universe may appear to have been written in Lisp, it was actually written mostly using Perl.

### #313: Insomnia



Crap, I have levitation class at 25:131. Better set the alarm to 'cinnamon'.

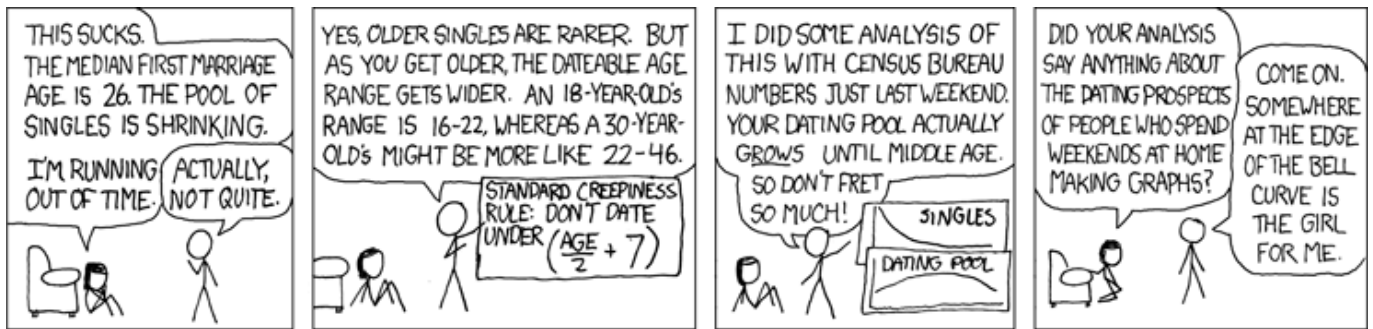
#### Explanation:

Simply put, the narrator's insomnia, combined with small bright lights in an otherwise pitch-black room, is causing him to hallucinate. Furthermore, the narrator is well aware that he will be unable to distinguish the hallucinations from reality. This finally occurs when his clock reads 13:72, which would not be possible on any clock.

A clock can never read "72 minutes," as there are only 60 minutes in an hour. While a clock can read "13 hours" on a 24-hour clock (which is common on most digital clocks in Europe, but not in the US), the thirteenth hour does not occur immediately after the fourth hour.[citation needed]

The title text shows that the narrator has indeed "succumbed" to his visions, and is assigning gibberish values — an alarm clock with a "cinnamon" setting, the time of day "25 hours and 131 minutes," and "levitation class" — to an otherwise normal monologue.

## #314: Dating Pools



The full analysis is of course much more complicated, but I can't stay to talk about it because I have a date.

### Explanation:

Megan is upset because she is apparently older than 26, and among people who marry, half do so below 26. The intuitive conclusion is that the number of potential partners is decreasing as time goes on.

The Half Plus Seven Rule is a rule that asserts that it is creepy to date anyone who is younger than half your age plus 7 years. For example, a 50-year-old dating someone who is younger than 32 ( $50/2 + 7 = 32$ ) would be considered creepy. As the graph shows, there is a lower limit and an upper limit.

- The lower limit defines the minimum age of your partner in order that you are not considered creepy.
- The upper limit defines the maximum age of your partner in order that they are not considered creepy.

The lower limit can be defined as  $f(x) = x/2 + 7$  in which  $x$  is your age and  $f(x)$  is the minimum age of your partner. The upper limit can be defined as  $f^{-1}(x) = 2(x - 7)$  in which  $x$  is your age and  $f^{-1}(x)$  is the maximum age of your partner.

As age increases, the age range of potential non-creepy partners widens. At 26, the range of non-creepy partners is 18 years (20- to 38-year-olds). At 50, it is 54 years (32 to 86 years old).

At age 14, you can only date people your own age. The same also works with infinity, but even Methuselah died once.

While the application of this rule actually reduces the number of potential matches further, Cueball presents it in a positive way by showing that there are whole swathes of people who she couldn't marry in the first place without being in a creepy relationship. But, as her age increases, the range of non-creepy partners also increases. Combined with Census Bureau data for how many people exist within any such range, Cueball shows that her eligible dating pool is in fact still increasing.

Megan notes that graph-making nerds like Cueball may have a hard time finding dates, but this is refuted by the title text.

I LEARNED TO READ BRAILLE A WHILE BACK,  
AND I'VE NOTICED THAT THE MESSAGES ON  
SIGNS DON'T ALWAYS MATCH THE REGULAR TEXT.



The only big difference I've seen is in colors. Where the regular text reads 'press red button', the braille reads 'press two-inch button'.

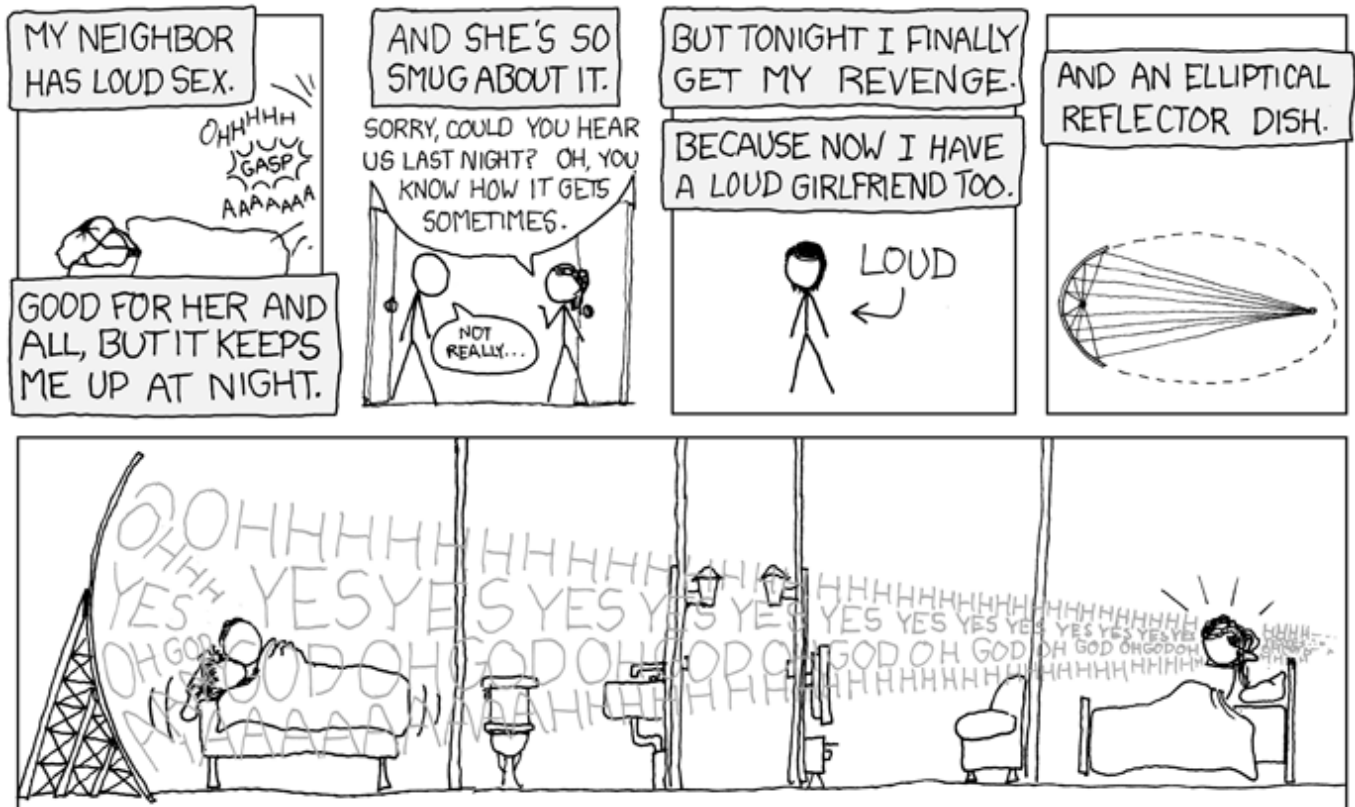
### Explanation:

Braille is a writing system for the blind and visually impaired using bumps on a paper, slate, etc. However, since most sighted people have no need for braille, and because braille messages may need to convey purely-visual information to blind people, the braille message may be adjusted from the original message. In this case, however, it acts as a jab toward people who are not blind, saying that "sighted people suck," which is obviously not something you would typically see (no pun intended) on informational signs.[SIGHTation needed] Similar "translations" can be found when one deciphers the alien translations on nearly all signs in the TV show Futurama.

The title text shows a practical (and more realistic) example of where regular text and

braille text may differ. As the visually impaired cannot see color,[SIGHTation needed] the label would need to identify some other defining feature of the button in question, such as the given measurement.

## #316: Loud Sex



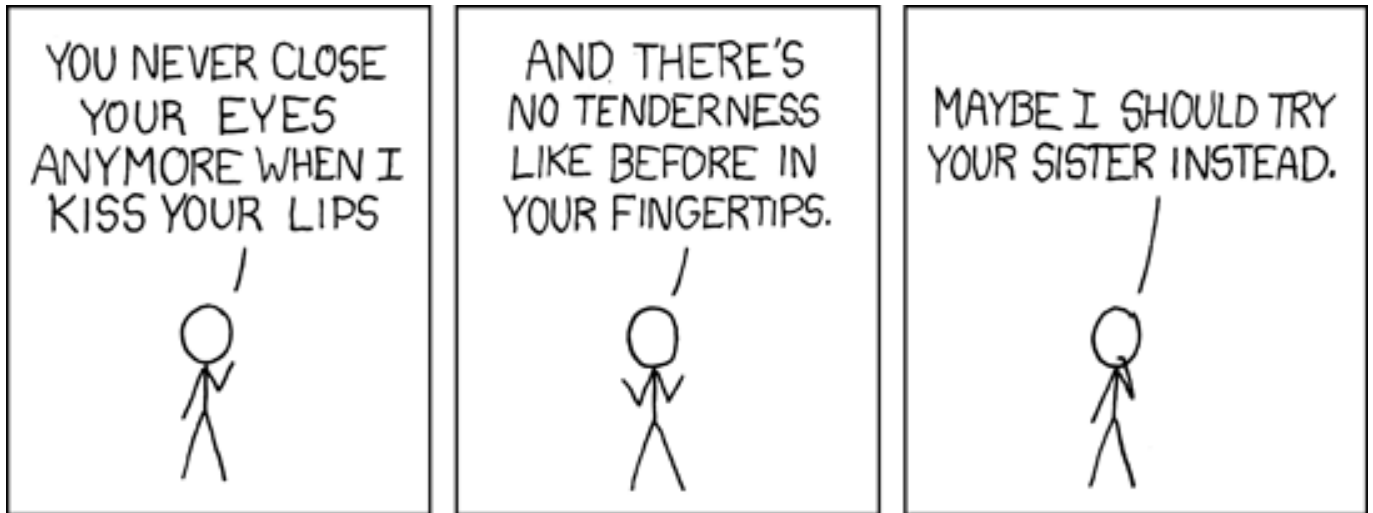
Spherical or parabolic reflectors would of course lead to aberrant behavior.

**Explanation:**

Cueball's neighbor likes to engage in loud sex, which keeps Cueball awake at night, and she pretends to apologize for it as a way of bragging, so Cueball wants to get revenge. A simple way would be to inflict the same to her in retaliation by having loud sex when she is not. But Cueball adds a science nerd's touch to it, with an elliptical reflector dish. As shown on the schema, such a dish reflects the sound waves in a way that all waves originating from a specific point (the first focus of the ellipse the dish's shape is based on) converge after reflection to a specific other point (the second focus of the same ellipse). [note 1] Cueball calibrates and installs his elliptical dish in such a way that all the sound coming from his loud girlfriend's head during sex is concentrated after reflection to his neighbor's head in her bed. This makes his loud sex far louder to her than hers was to him.

The title text makes a double entendre. A spherical mirror can cause the signal from across the reflector to not focus at the same spot -- spherical aberration -- but the play on words leads the reader to believe that aberrant sexual behavior would occur. (Parabolic mirrors do not suffer from this kind of aberration.)

### #317: 'That Lovin' Feelin'



Maybe there's no tenderness in her fingertips either, but at least **SHE** puts out.

#### **Explanation:**

This is a parody of the popular song by The Righteous Brothers, "You've Lost That Lovin' Feelin'." The singer is talking about the cooling of his relationship with his significant other, and how the joy of their romance has been missing lately, and asks what they have to do to get it back. The actual first verse and chorus are as follows:

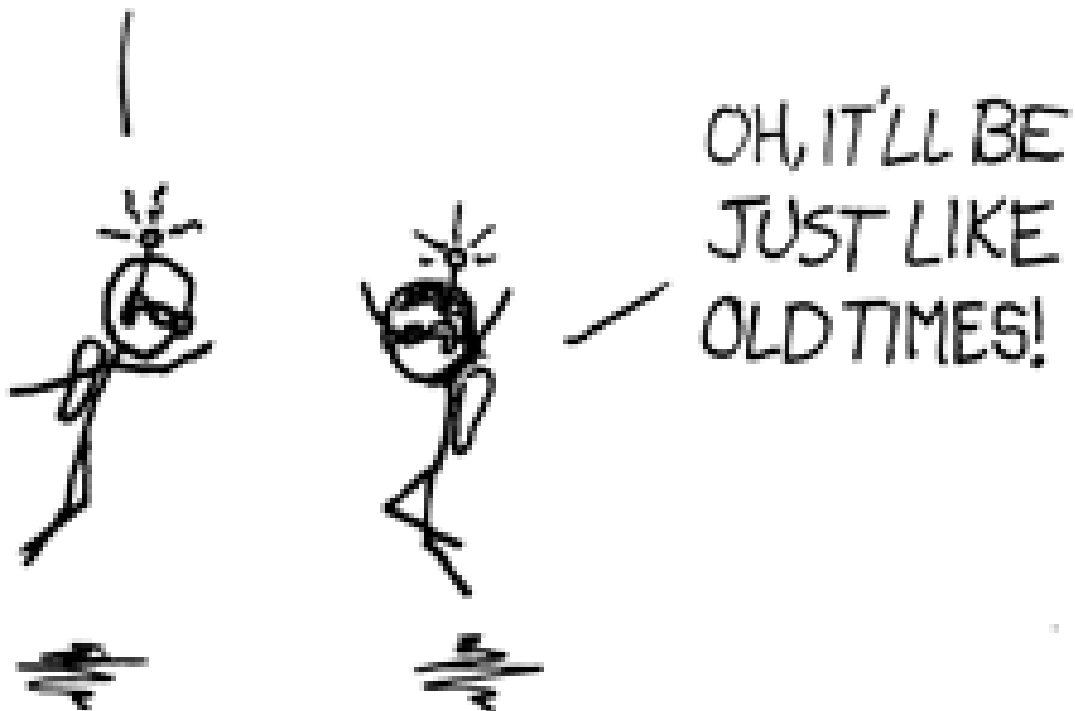
In this comic's parody of the song, Cueball decides that since his relationship with his current girlfriend is cooling, maybe he should try her sister instead. (And as mentioned in the title text, at least she will have sex with him.)

49: Want, 279: Pickup Lines, and panel 20 of 442: xkcd Loves the Discovery Channel also have jokes centered around the same subject.



THIS GENERATION  
IS GOING TO HAVE  
SOME WEIRD NOSTALGIA.

DARLING, LET'S PUT ON OUR BEST  
FAKE ACCOUNTS, CONNECT TO THE  
CORE FORUMSPACE, AND TRICK  
PEOPLE INTO LOOKING AT A PICTURE  
OF A MAN'S DISTENDED ANUS!



If you don't get this one, don't google it.

**Explanation:**

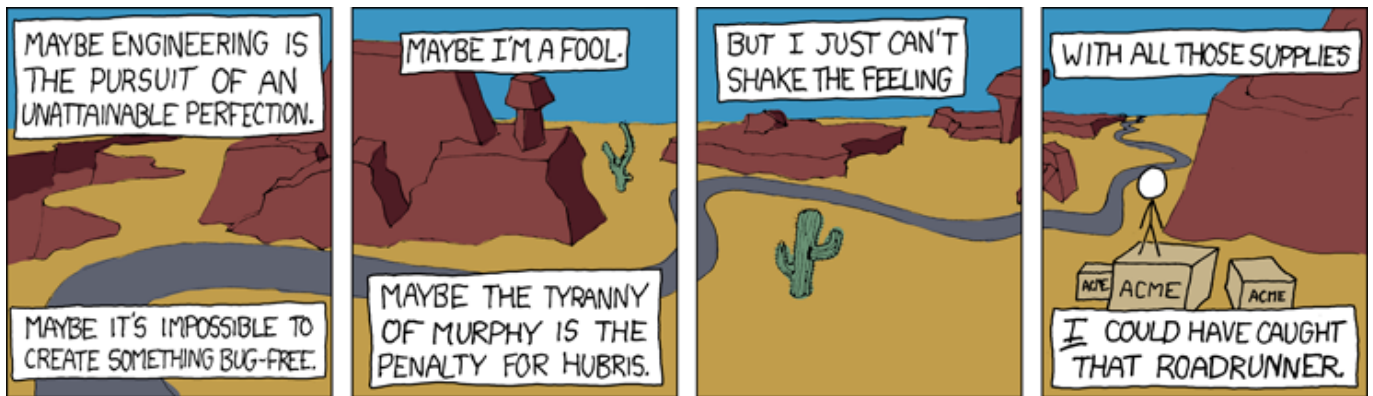
Cueball and Megan refer to the practice of tricking people to see shock sites using bait-and-switch pranks. A shock site is a website that is intended to be offensive, disgusting, and/or disturbing to its viewers, containing materials of high shock value that is also considered distasteful and crude, and is generally of a pornographic, scatological, extremely violent, insulting, painful, profane, or otherwise provocative nature.

This comic is a direct reference to the former shock site goatse.cx that displayed a human distended anus (among other things). The domain was taken down in 2004, but it remains a memorable cultural reference from its time period. It therefore may be cited as nostalgia by trolls in the future. This comic evidently takes place in the future, as the characters are using some sort of advanced levitation technology that has yet to exist.

The title text warns us not to Google this meme, as it contains some horrifying results. If you ignore the warning from the title text and Google for "distended anus," you will find many results on this awful dysfunction like rectal prolapse.

Furthermore, the aforementioned shock site still exists.

## #319: Engineering Hubris



Chuck Jones is a vengeful god.

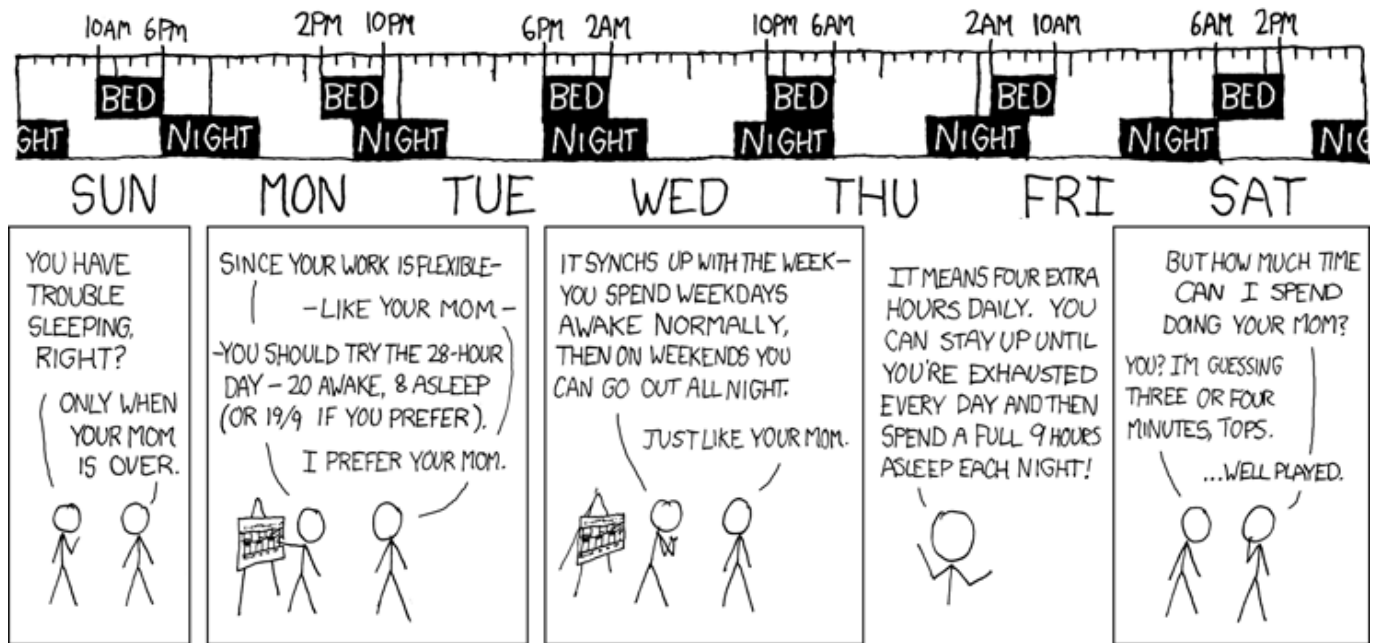
### Explanation:

This comic starts with a philosophical musing about engineering. The last panel reveals a joke about Wile E. Coyote and The Road Runner, a cartoon series created by Chuck Jones. In the cartoon, the Coyote is constantly building odd contraptions (with parts ordered from the Acme Corporation) to catch the Road Runner. The Coyote never succeeds, often because his devices don't work as intended.

The word Hubris from the comic title means extreme pride or arrogance. It is a theme from the classic Greek plays, and is usually severely punished by the gods. The title text is implying that Chuck Jones would not let hubris go unpunished; the engineer might be able to construct 'better' traps than Wile E, but they would still be doomed to fail.

From the second panel, Murphy's Law can be simplified to "Anything that can go wrong will go wrong." It was originally developed as a guideline for accident prevention starting at the design level. In the common vernacular today, it is interpreted more liberally: "If there is even the slightest chance of an unfortunate accident occurring, despite all your attempts to prevent it, the accident will happen anyway, purely out of spite." The namesake Edward A. Murphy Jr. has since evolved to mythic proportions, being cast as a vengeful god of misfortune and ruin.

## #320: 28-Hour Day



Small print: this schedule will eventually drive one stark raving mad.

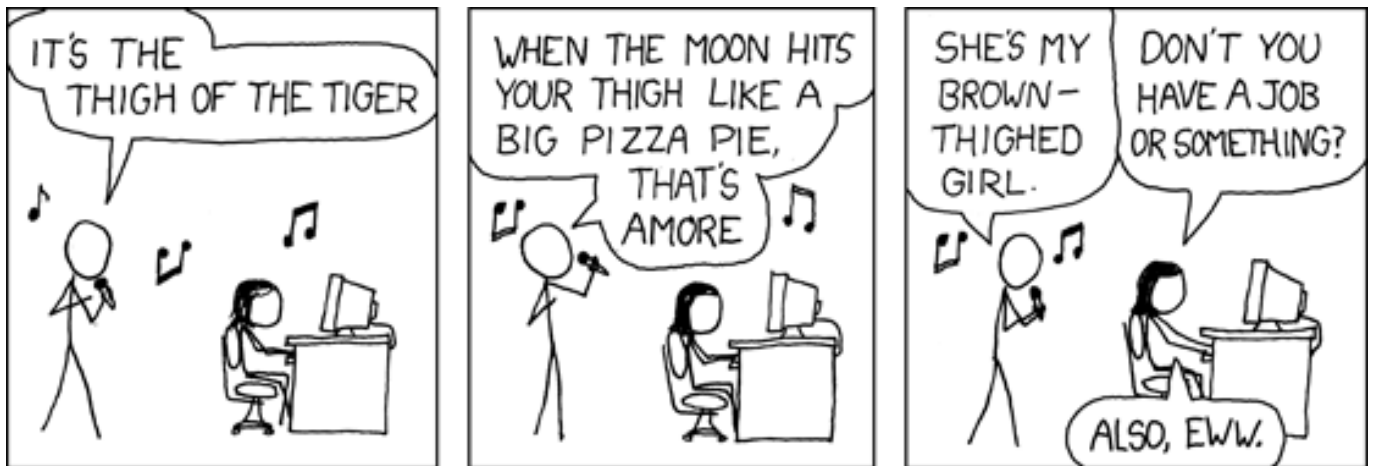
### Explanation:

The 28-Hour Day is a modified sleep schedule proposed to accommodate the discrepancy between the earth's day-night cycle and certain people's preferred sleep schedules. It discards the traditional notion of sleeping at night and replaces it with sleeping when it is more convenient for weekend parties and mid-week insomnia. It is one of the alternative day lengths that will sync with the widely accepted and practiced 168-hour week ( $168 = 7 \times 24 = 6 \times 28$ ), with another option being eight 21-hour days. Underneath the weekly timeline, Cueball describes the schedule's selling points to his friend, who apparently has difficulty sleeping.

Cueball's friend shows little interest in this idea, and instead he resorts to low-quality "your mom" jokes. Cueball merely bides his time, and in the end successfully trumps the jokes with a response that impugns his friend's sexual stamina, leading him to concede defeat.

The title-text uses "Small print" to mean "Disclaimer" and relieves the idea's creator of any responsibility in the case that it is tried and the tester finds the schedule to be a really bad idea. As he states, if you live by this schedule, chances are you will be driven stark raving mad. Given that Cueball gives his friend with the bad mom jokes this advice, it could be another way to try to punish him for the jokes. Although Randall makes several Your Mom comics, he has also in some comics shown that he dislikes these kind of jokes, especially when used too much in real life (see 366: Your Mom.)

## #321: Thighs



My thighs have seen the glory of the coming of the Lord?

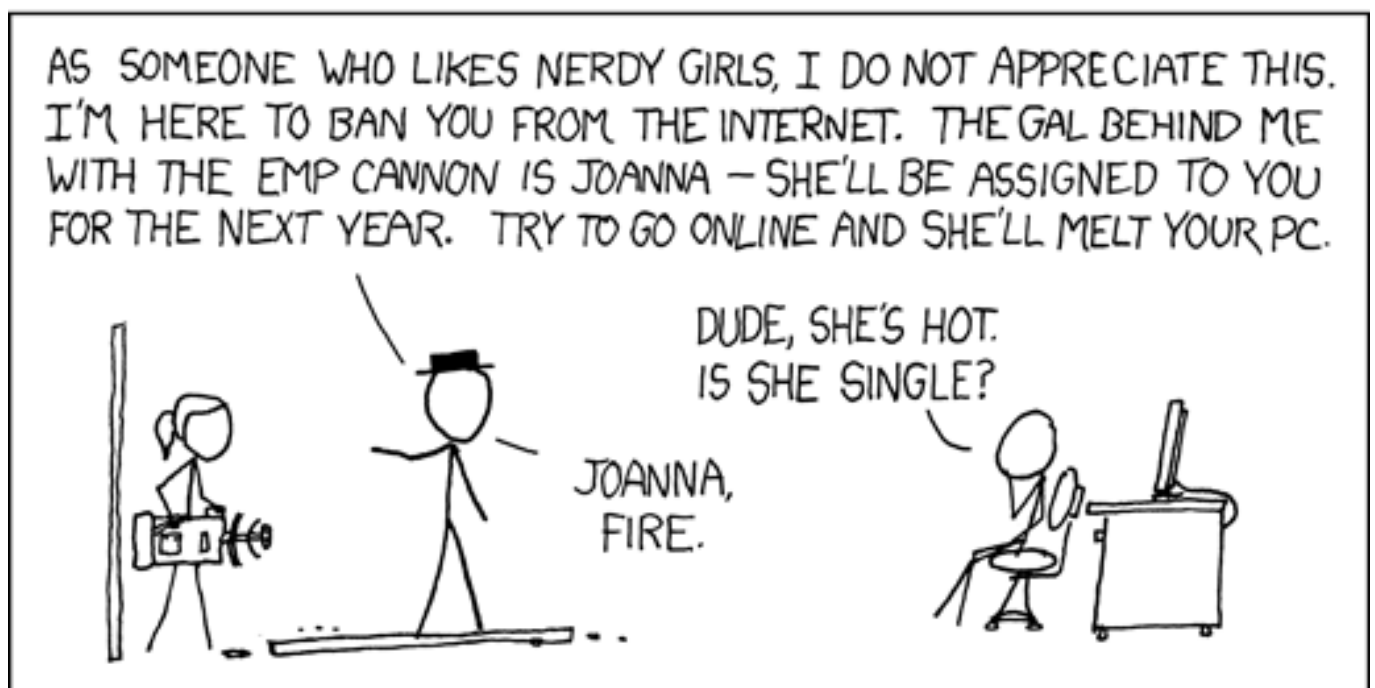
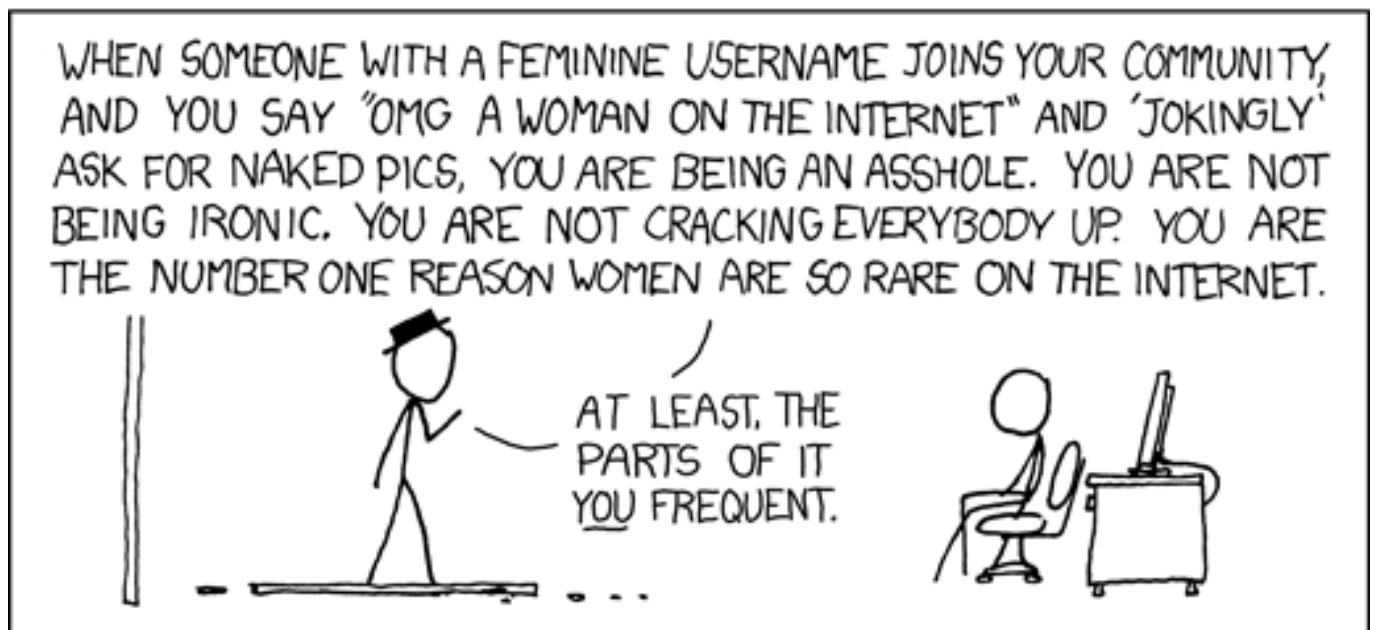
### Explanation:

In each panel, Cueball sings a verse from a different song where he replaces the word "eye" with the word "thigh." First it is Survivor's "Eye of the Tiger," then Dean Martin's "That's Amore," and finally Van Morrison's "Brown Eyed Girl."

The comic shows how vastly different each song's meaning becomes when "eye" is replaced with "thigh." In the last panel, Cueball's version makes Megan go "eww," and she asks him if he doesn't have a job he should be doing instead. The eww refers to the fact that the brown-eyed girl turns into a brown-thighed girl, and such colored thighs could be eminently possible via an act of poor defecation on oneself, hence the disgust reaction from Megan.

In the title text, it seems that Cueball continues with a reference to the first line of The Battle Hymn of the Republic, adding to the humorous effect, since typically thighs cannot see. But mainly it is a sexual joke playing on the double meaning of "coming".

In 1814: Color Pattern, Randall makes his own version of "That's Amore," this time letting Megan sing it to Cueball.



But one of the regulars in the channel is a girl!

### **Explanation:**

Though this comic predates it, there is an Internet meme best stated as "there are no girls on the Internet." It is also known as Rule 16 or Rule 30 of the Internet. This comes partly from a supposition that girls aren't smart enough to go on the Internet or even use technology, and more directly from the idea that they are afraid of interacting in such a male-dominated subculture, so anyone claiming to be female on the Internet must be a guy pretending to be one for the purposes of active or passive trolling. Thankfully for humanity at large, the meme is now the opposite of true, but still lives on as a joke, albeit not always a pleasant one. For many users, the puerile nature of the Internet creates a repulsive force because of exactly what Cueball is doing. As soon as anyone claims to be a woman online, there will invariably be a slew of "tits or gtfo" replies.

Randall projects this stereotypical Internet douchebaggery onto Cueball, who behaves this way out of misogyny thinly disguised as a joke. This barely-a-joke, found in certain areas of the Internet (especially IRC and 4chan), holds the view that women are only "good for" sex and porn. By making such a huge deal out of her being a girl, he directs unwanted sexual attention at any woman who joins.

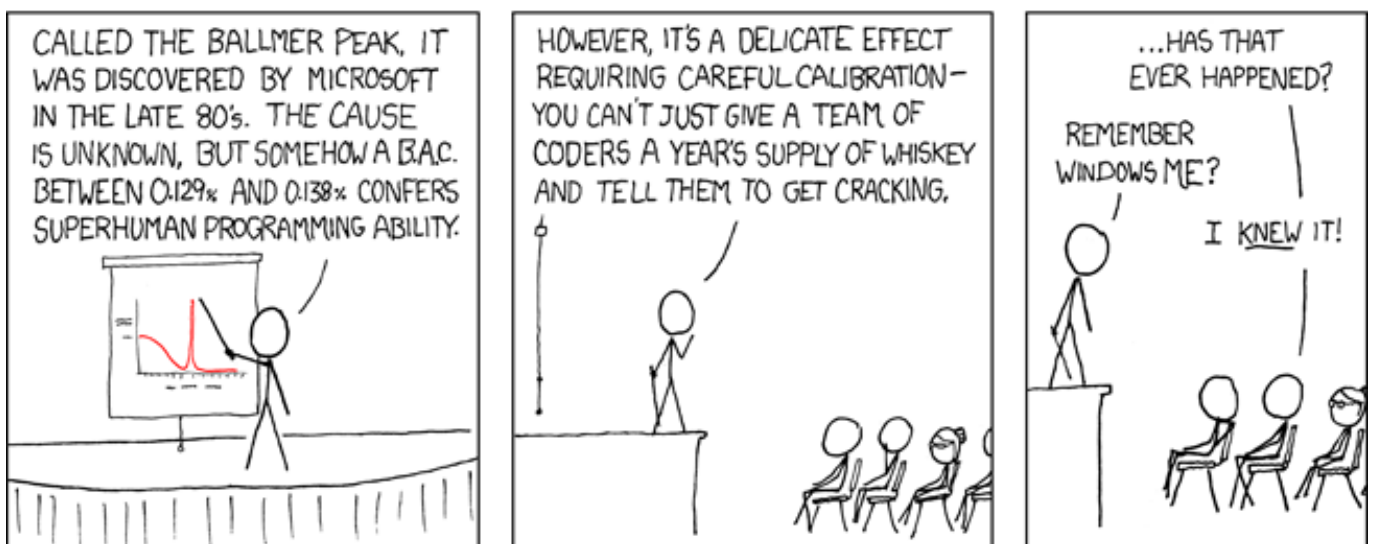
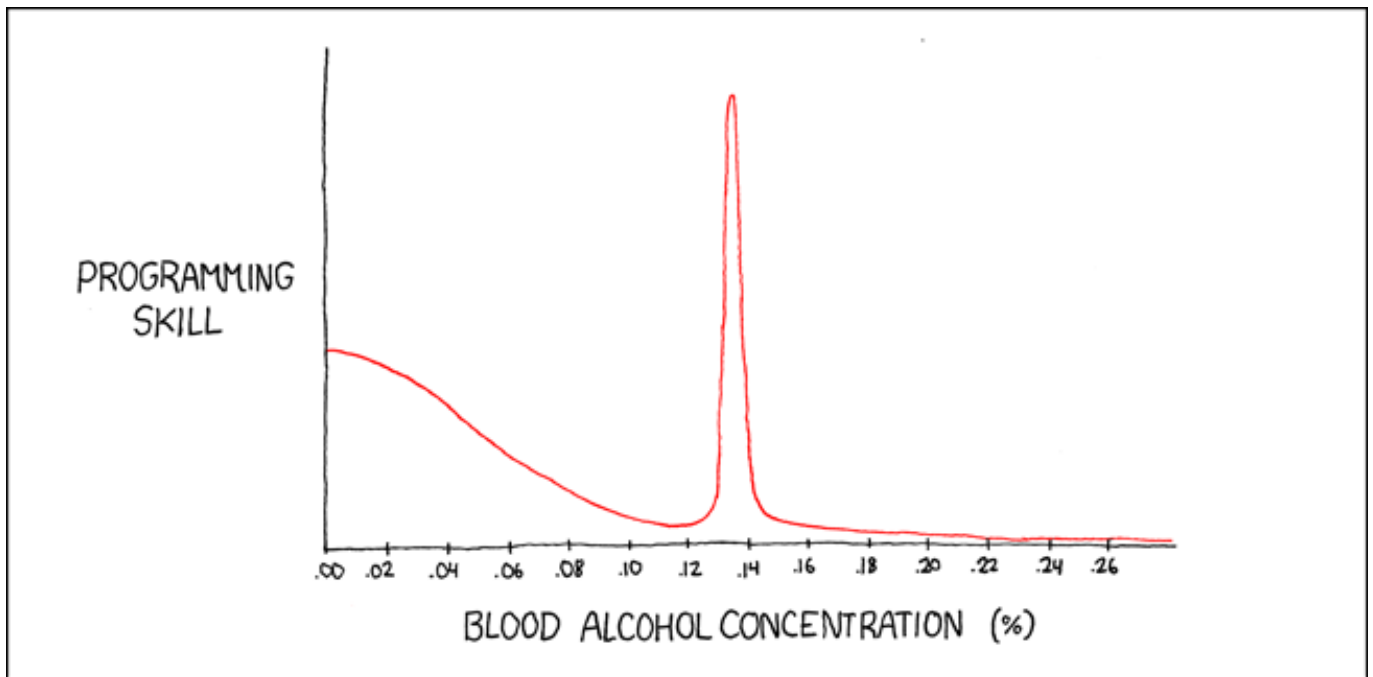
Black Hat, while usually a destructive force and self-proclaimed classhole, here switches positions with Cueball, standing up for women everywhere. (This makes sense when you consider that Black Hat tends to pursue Randall's thoughts in a more controversial way, see 86: Digital Rights Management). However, he still keeps some of his destructive tendencies and knocks down Cueball's door. He enlists the help of a Ponytail character named Joanna to ban Cueball from the Internet. (More than 9 years later, Joanna is hired to help Hillary Clinton win the 2016 United States presidential election in 1756: I'm With Her, released the day before that election. She is also shown in the 1000: 1000 Comics, where she is seen at number 653.)

IRC is the acronym for Internet Relay Chat. It is a protocol that eventually evolved into the instant messengers, chat rooms, and XMPP (formerly Jabber) servers around today. With the advent of live-streaming video online, IRC channels are making a come-back as a way for hosts and audiences to communicate with each other in real-time.

An EMP is an electromagnetic pulse that will disrupt electronics from functioning normally. An EMP is a short burst of electromagnetic energy. Small EMPs will disrupt electricity momentarily, while larger EMPs are capable of burning out circuitry and erasing hard drives.

At the title text, Cueball tries to defend his misogyny by claiming that one of his IRC chat system acquaintances is a girl, as if to imply that that makes his words no longer misogynist (this is similar to the defense "I'm not racist! Some of my best friends are black!").

### #323: Ballmer Peak



Apple uses automated schnapps IVs.

#### Explanation:

This comic is about alcohol and programming ability. Programmers sometimes have a reputation for drinking habits, and programmer gatherings (such as hackfests) tend to offer copious amounts of alcohol. More generally, intoxicated programmers can get the impression that, by being a little disconnected from physical reality, they become more efficient at their programming. The comic is a take on this belief, with two references:

- In atomic physics, "Balmer peaks" (with one L) are peaks in the emission spectrum of hydrogen (named after the 19th century scientist Johann Balmer).
- Steve Ballmer (with two Ls) is a key figure of Microsoft and its CEO from 2000 to 2014; he is known for energetic outbursts and outlandish behavior in public (with some videos gone viral), which can give the impression that he is constantly intoxicated.



The curve in the comic suggests that, while generally decreasing with alcohol intoxication, at just the right level, the skill of a programmer gets terrific indeed. Randall named the peak after Steve Ballmer, as if discovered by him; this references the analogously named Balmer peaks (with one L), and the idea that Steve Ballmer makes for an easy association of programming and alcohol. The peak of the curve occurs at a BAC of 0.1337%, which is a reference to leet. (See this interview with Randall).

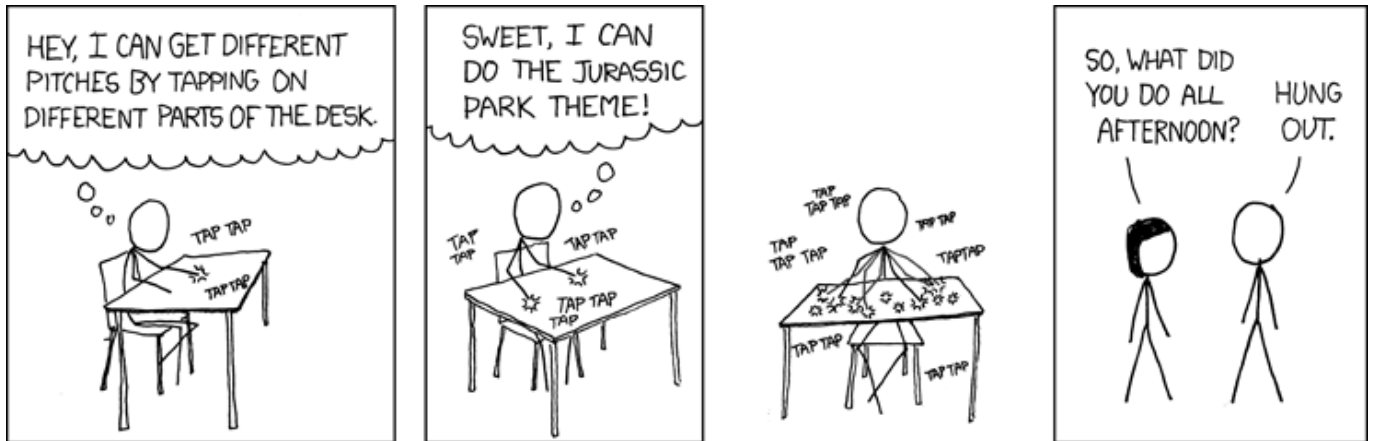
The end of the comic turns the whole idea into a sideways jab at Windows ME, a version of Microsoft Windows often criticized for being buggy, slow, and unstable: it suggests that ME was developed by programmers completely drunk, because their managers wanted to exploit this "Ballmer peak," but did so without any precaution. That idea fit the result of a buggy and unstable product well.

On the contrary, the title text claims that Apple uses this effect with careful calibration, by delivering precise quantities of alcohol (schnapps) to its programmers via intravenous therapy (IV).

An actual research paper published in March 2012 showed that the situation described in this comic is not far from reality. Researchers found that intoxicated participants performed better than sober participants on a test that evaluates creative problem solving skills, and were also more likely to evaluate their own solutions as insightful. However, the study only tested a B.A.C. of 0.075%, not between 0.129% and 0.138% as displayed in the comic.

From xkcd: volume 0:

## #324: Tapping



Sometimes the best fun looks like boredom.

### Explanation:

In the first panel, Cueball makes the chance observation that tapping different points on a desk's surface results in different pitches being produced, a consequence of the desk's different resonant frequencies at these points. He soon learns that by using the pitches produced, he can replicate the well-known theme music to the film Jurassic Park. The third panel depicts that, given a lack of other entertaining stimuli, Cueball soon becomes engrossed in his newly discovered musical instrument, and his music grows in complexity.

This is a fun observation about part of human nature, to which many people can relate. Sadly, Cueball doesn't feel like telling Megan what he did, and instead, he just gives her an empty answer. Cueball perhaps feels, as Randall suggests in the title text, that he could not explain why the tapping activity was fun in its own right and not just a consequence of boredom, so he avoids having to explain in the first instance.

Other comics have shown the idea of feeling embarrassed by what one likes, to the point of refusing to admit that one likes it. Examples are 245: Floor Tiles and the title text of 1103: Nine.

### #325: A-Minus-Minus



You can do this one in every 30 times and still have 97% positive feedback.

#### Explanation:

Black Hat is trying to make the world a weirder place by shipping bobcats to his eBay buyers. Ordinarily, negative feedback is used to warn future buyers about sellers who ship broken products or post misleading listings. In this case, the unfortunate buyer is leaving feedback warning future buyers that Black Hat ships bobcats instead of the actual products, though "would not buy again" seems to be a rather feeble response to the replacement. This appears to have been a continuing project, as Cueball receives random packages a year and a half later (576: Packages). Four years later, it is shown that you can blackmail Black Hat into not sending you a bobcat (837: Coupon Code). This comic is also referenced in a popular Amazon review for Randall Munroe's book, *What If: Serious Scientific Answers to Absurd Hypothetical Questions*.

The weak "would not buy again" comment is a play on the stock "would buy again" comment often found in positive eBay feedback; the title "A-Minus-Minus" is a play on the frequent comment "A++." That in turn, sometimes with varying numbers of pluses, seems to be an easy way people use to pad the end of an eBay comment field to the maximum 80 characters. It's also a reference to jokes in which exceptionally good schoolwork is graded with extra pluses after an A+ (and exceptionally bad work is graded with large numbers of minuses after an F).

The title text is about a flaw in eBay's feedback system: You can intentionally do nasty things to your buyers and get very bad reviews, but still have overall high feedback scores as long as you don't do it too often. (See also 937: TornadoGuard, which shows a different flaw in the concept of averaging reviews — namely that five-star reviews for aesthetic qualities are weighted equally to one-star reviews for major functional deficits — and 1098: Star Ratings, which addresses the topic as well.) These reviews would be disregarded by future customers as well for their weirdness.

MY HOBBY:

USING THE MORE OBSCURE MEANINGS  
OF "AFFECT" AND "EFFECT" TO TRY TO  
TRIP UP AMATEUR GRAMMAR NAZIS.

I THINK THAT OUR  
FOREIGN POLICY  
EFFECTS THE SITUATION.



Time to paint another grammarian silhouette on the side of the desktop.

**Explanation:**

"Affect" and "effect" can each both be a noun and a verb, share the sense of influence, and they are often confused with each other. (See the usage note under "Affect.")

In careful speech, both words (as verbs) are similar but not identical. "Affect" is /ə'fekt/ (or uh-fekt) and "effect" is /ɪ'fekt/ (or ih-fekt). However, for some people, these words are homophones — it's also explained here: [homophones affect vs effect](#).

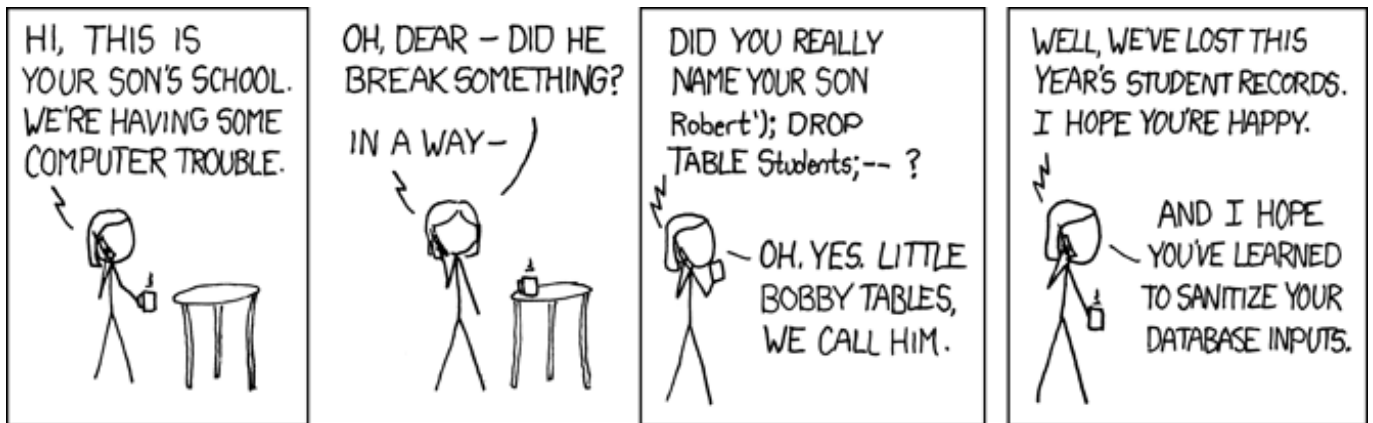
"Effect" is usually a noun, meaning a result, and "affect" usually a verb, meaning to act upon. "Effect" as a verb has the slightly different meaning to bring about. Cueball says that the foreign policy causes the situation, not, as the "grammar nazi" thinks, that it changes the situation.

The title of the comic translates to cause or bring about a result, which is just what Cueball does! It can also be seen as a play on words, being similar to the phrase "cause and effect."

The title text refers to the Victory marking practice common among fighter pilots in a war zone. Fighter pilots who score a "kill" on an opposing aircraft will have a silhouette of the downed plane painted on the side of their plane as a way of keeping track of kills. In this sense, Cueball "shot down," figuratively speaking, an online (grammar) nazi, and would mark it by painting a silhouette on the side of his computer.

See also 1429: Data.

## #327: Exploits of a Mom



Her daughter is named Help I'm trapped in a driver's license factory.

### Explanation:

Mrs. Roberts receives a call from her son's school. The caller, likely one of the school's administrators, asks if she really named her son Robert'); DROP TABLE Students;--, a rather unusual name. Perhaps surprisingly, Mrs. Roberts responds in the affirmative, claiming that she uses the nickname "Little Bobby Tables." As the full name is read into the school's system's databases without data sanitization, it causes the "Students" table in the database to be dropped, meaning it gets deleted.

This comic was a prequel for the 1337 series where the entire family is shown for the first time. The title of this comic is a pun: "exploit" can mean an accomplishment or heroic deed, but in computer science, the term refers to a program or technique that takes advantage of a vulnerability in other software. The title can also refer to her choice of name for her son, which is rather extraordinary. In SQL, a database programming language, commands are separated by semicolons ;, and strings of text are often delimited using single quotes '. Parts of commands may also be enclosed in parentheses ( and ). Data entries are stored as "rows" within named "tables" of similar items (e.g., Students). The command to delete an entire table (and thus every row of data in that table) is DROP TABLE, as in DROP TABLE Students;. In 1253: Exoplanet Names, someone (presumably Mrs. Roberts) attempts to perform a similar trick, submitting the name e'); DROP TABLE PLANETS;-- to the IAU.

The exploited vulnerability here is that the single quote in the name input was not correctly "escaped" by the software. That is, if a student's name did indeed contain a quote mark, it should have been read as one of the characters making up the text string and not as the marker to close the string, which it erroneously was. Lack of careful parsing is a common SQL vulnerability; this type of exploit is referred to as SQL injection. Mrs. Roberts thus reminds the school to make sure that they have added data filtering code to prevent code injection exploits in the future.

For example, to add information about Elaine to a data table called 'Students', the SQL query could be:  
`INSERT INTO Students (firstname) VALUES ('Elaine');`

However, using the odd name Robert');DROP TABLE Students;-- where we used "Elaine" above, the SQL query becomes:

```
INSERT INTO Students (firstname) VALUES ('Robert');DROP TABLE Students;-- ');
```

By insertion of the two semi-colons in the odd name, this is now three well-formed SQL commands:

```
INSERT INTO Students (firstname) VALUES ('Robert');
```

```
DROP TABLE Students;
```

```
-- ');
```

The first line is valid SQL code that will legitimately insert data about a student named Robert. The second line is valid injected SQL code that will delete the whole Students data table from the database. The third line is a valid code comment (-- denotes a comment), which will cause the rest of the line to be ignored by the SQL server. For this to work, it helps to know the structure of the database. But it's quite a good guess that a school's student management database might have a table named Students.

Of course, in real life, most exploits of this kind would be performed not by engineering a person's name such that it would eventually be entered into a school database query, but rather by accessing some kind of input system (such as a website's login screen or search interface) and guessing various combinations by trial and error until something works, perhaps by first trying to inject the SHOW TABLES; command to see how the database is structured. In 2019, a person chose a vanity license plate that said "NULL" and subsequently received thousands of dollars in fines from random vehicles for which the license plate was unavailable. Some database programmers somewhere along the way failed to consider the difference between the string NULL and the value NULL.

In 2017, a Swiss group called their book "<script>alert('!Mediengruppe Bitnik');</script>" to make e-commerce websites display an innocuous pop-up as soon as the book name loads. It immediately worked on several sites and to this day, some websites are still affected. In 2020, the British corporate register accepted a registration for "<SRC=HTTPS://MJT.XSS.HT> LTD", which was soon officially renamed "THAT COMPANY WHOSE NAME USED TO CONTAIN HTML SCRIPT TAGS LTD" to avoid a cross-site scripting problem.

To include the odd name correctly and harmlessly in the Students table in the school database the correct SQL is:

```
INSERT INTO Students (firstname) VALUES ('Robert');DROP TABLE Students;-- ');
```

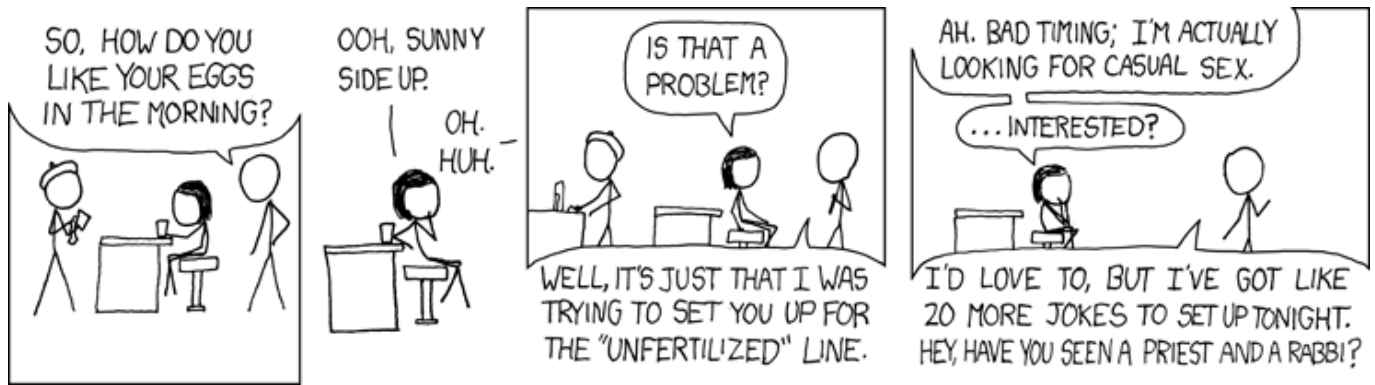
Note that the single quote after Robert is now sanitized by doubling it, which changes it from malicious code to harmless data, and the full first 'name' of the student Robert');DROP TABLE Students;-- is now stored correctly. It should be noted that while data sanitization can mitigate the risks of SQL injection, the proper prevention technique is to use Prepared statements. Noting the difference between the "actual" name using the word TABLE and the child's nickname being Bobby Tables, one could argue that there's an implied reference to one of the most argued topics of database naming conventions - should table names be singular or plural.

The title text references that Mrs. Roberts' daughter is named "Help I'm trapped in a driver's license factory". This is a play on how if someone is stuck and forced to work in a



manufacturing factory/plant, then they will write on the product "Help I'm trapped in a \_\_\_\_\_ factory" in order to tell people on the outside. Having this name would cause any police officer who pulls her over to show some concern towards the hypothetical artisan who created the identification. And getting the license in the first place would likely be difficult. The idea of inserting a help message like this was already used in 10: Pi Equals. It was later revealed that the daughter's middle and last names (which she more generally was known by) together are "Elaine Roberts".

## #328: Eggs



Oh, yeah, we get tons of them at these casual sex bars.

### Explanation:

At a bar, Cueball uses what appears to be a common cheesy pick-up line: "So, how do you like your eggs in the morning?" — implying that he will be the one cooking them, because they will still be together in the morning, after they spent the night having sex.

For women who do not appreciate such paltry attempts at soliciting sexual intercourse, a sardonic counter-response to the pick-up line is "unfertilized," which switches the meaning of "eggs" from chicken eggs to female gametes, expressing the sentiment that they do not wish to have sex. However, in this scenario, it turns out Cueball is not actually trying to solicit sex from Megan at all, but is just interested in setting up jokes. Megan's desire for actual casual sex therefore subverts his plan for comedy. He politely declines her offer and tries instead with a different joke using the classic snowclone priest and rabbi setup.

The title text continues the conversation, where Megan reveals that the bar is actually a "casual sex bar" and further suggests that priests and rabbis do in fact come to the bar frequently. This is in contrast to real life, where such bars would probably not be frequented by religious leaders.[citation needed]

TURING TEST EXTRA CREDIT:  
CONVINCE THE EXAMINER  
THAT HE'S A COMPUTER.

YOU KNOW, YOU MAKE  
SOME REALLY GOOD POINTS.

/

I'M ... NOT EVEN SURE  
WHO I AM ANYMORE.



Hit Turing right in the test-ees.

**Explanation:**

In brief, a Turing test is a test for assessing whether a machine/program demonstrates

"intelligent" behaviour. Suggested by Alan Turing, the test involves a human examiner talking through a computer terminal to either a human or a computer — which it is, is not known to the examiner. If the machine/program's responses convince the examiner that they are talking to a human, the machine/program is said to be passing the test. This comic suggests that extra credit should be awarded if the machine/program is capable of "counter-convincing" the examiner that they're actually a computer.

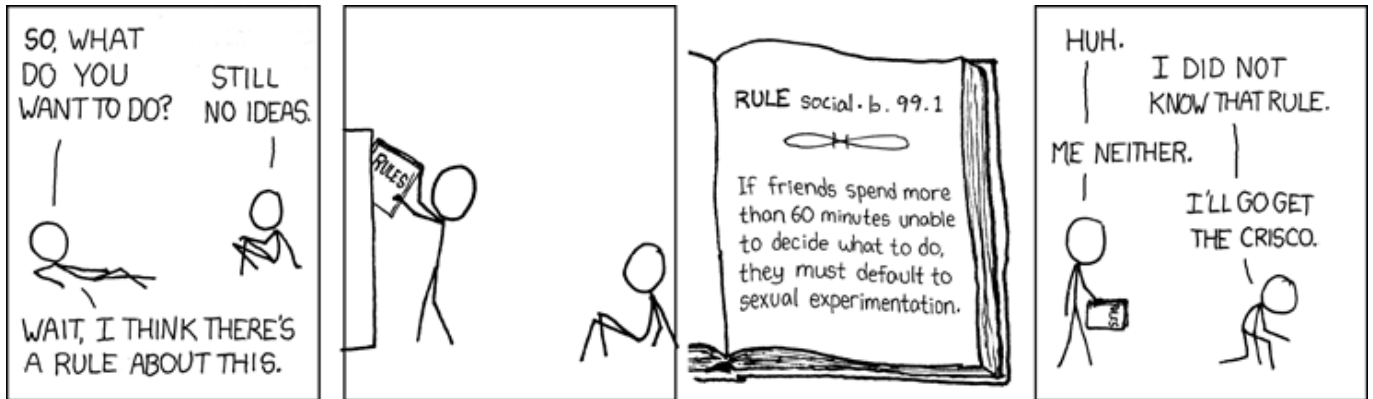
The most common implementation of a Turing test Internet users may see is the CAPTCHA (Completely Automated Program to Tell Computers and Humans Apart), which is often found on web site registration pages and usually involves trying to identify letters/numbers in an image. The text in the image is often distorted and/or in different colors or sizes or fonts, or may be very blurry as if from a very bad photocopy. This is to deter an automated OCR (Optical Character Recognition) program from easily identifying the characters. The idea is that humans can process and decipher things from highly distorted pictures much easier than (current) computer algorithms can.

The caption makes a play on words, in that extra credit (optional additional work to perform) is sometimes offered on curricular examinations ("tests") to allow the taker to increase their total score by demonstrating a heightened understanding of the subject, but the Turing test is not such a test. (This misapplication of vernacular associated with academic testing to a non-academic procedure that also bears the name test is a common vehicle of humor, as in "what if I take a blood test, and don't pass?" One may pass or fail an academic exam, but a blood test only identifies blood type, and the concept of passing or failing is not applicable.)

Similarly, the title text makes a play on words with "test-ees" vs testes suggesting that such extra credit would be an ironic twist to Turing test. (Hitting or kicking an adversary in the testes is considered dirty fighting.) This play on words is actually itself a form of aural CAPTCHA; humans can processes and recognize puns for what they are, but machines generally run afoul of the ambiguity. (Unless Randall trained them for it as in 1696: AI Research.)

A person with an appreciation for macabre humor will note that actually hitting Alan Turing in the testes would be rendered somewhat ineffectual by the fact that the British government chemically castrated him after he was convicted of "gross indecency" (Victorian-era code for homosexual acts between men) under the Labouchere Amendment in 1952. Whether or not this was intended by Randall is uncertain.

### #330: Indecision



Hey, I don't make the rules. It's in the book.

#### Explanation:

These two friends (both presumably male, since female characters in xkcd are depicted with hair) are surprisingly cavalier in taking the suggestion to engage in sexual experimentation to alleviate boredom. Even if both men are gay, the fact that they're friends (as the rule in the book describes them) suggests that they are not currently having sex on a regular basis.[citation needed] In this case - and even more so if the friends are heterosexual - most people would not take the book's suggestion, and it may even make them feel embarrassed and awkward.[citation needed]

The book that one of the Cueballs grabs appears to be some sort of all-encompassing rule book, its reach including the social sphere. Obviously this book is fictional, but the line "I think there's a rule about this" sounds like a reference to folk "rules" or guidelines like the "five-second rule."

Crisco is a brand of shortening, a fat that is solid at room temperature and frequently used in baking, though is also sometimes used, as implied in this instance, as a sexual lubricant. Crisco was referenced again in a sexual context in the title text of 414: Mistranslations and later as a part of a weird dream also in the title text of 557: Students.

The title text could be spoken by either one of the characters or Randall. It attempts to preempt any awkwardness or judgment the reader may have about this situation by transferring responsibility to the rule book.

# MY HOBBY: INSISTING THAT REAL-LIFE OBJECTS ARE PHOTOSHOPPED.

THIS SABRE IS A  
19<sup>TH</sup> - CENTURY  
FAMILY HEIRLOOM.

|  
HUH?

IT LOOKS  
PHOTOSHOPPED.

|  
YEAH, THE REFLECTIONS  
ARE ALL WRONG.  
DEFINITELY PHOTOSHOPPED.



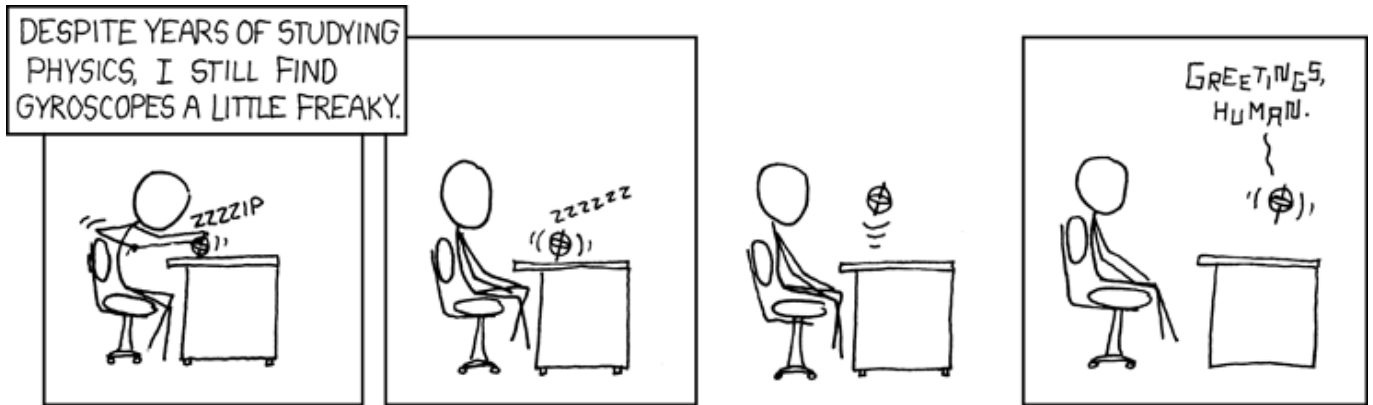
When I look into your eyes, I see JPEG artifacts. I can tell by the pixels that we're wrong for each other.

### **Explanation:**

This is another comic in the My Hobby series. This whole comic, including the title text, is a play on the then-popular internet meme "This Looks Shopped". It may also be making fun of how everything and anything you find on the internet has someone insisting that it's 'fake' or 'photoshopped', regardless of whether it's true in actuality. Adobe Photoshop is a popular image manipulation tool used to manipulate photographic images and for drawing. Of course, Photoshop and similar tools like Paint Shop Pro can only be used for imagery, not for real life objects.[citation needed]

The title text contains the second part of the internet meme, the complete text of which is: "THIS LOOKS SHOPPED / I CAN TELL FROM SOME OF THE PIXELS AND FROM SEEING QUITE A FEW SHOPS IN MY TIME." JPEG is an image compression algorithm that works by finding frequencies in blocks of 8x8 pixels and saving that instead of the original pixels. This works remarkably well, but sometimes leaves artifacts that can be seen when zooming in enough. The iris of an eye contains all kinds of odd colored spots - and there's not a JPEG algorithm in sight.

### #332: Gyroscopes



We didn't actually land on the moon -- it just looked like we did because of precession. Also, gyroscopes caused 9/11.

#### Explanation:

Cueball is playing with a gyroscope. Even though he has studied them and intellectually understands their behaviour, they still seem somewhat mysterious. At the end of the comic, the gyroscope is revealed to have the power of levitation and to apparently be a sentient lifeform (it talks to him).

In the title text, Randall is mocking the Moon landing conspiracy theories and refers to the lunar precession in process. Gyroscopes and the lunar orbit both exhibit precession, a physical concept that non-scientists can find hard to grasp. Thus, it is a perfect subject for a lunar conspiracy theory. He goes on to claim that gyroscopes (which form part of the navigation system of every commercial airplane) were directly responsible for the 9/11 terrorist attacks.



### #333: Getting Out of Hand



Wikipedia's role as brain-extension, while a little troubling, is also really cool.

#### **Explanation:**

Given how Wikipedia has an ever-expanding variety of topics, the grand majority of them in great detail, there is a possibility (even a temptation) of relying on Wikipedia to learn from every topic that leaves you confused... even foreplay. ('Bedtime' and 'us time' are not necessarily 'computer time'.)

This comic may also be a reference to how people can get addicted to reading Wikipedia pages, because there are many interesting links on each page that people haven't read yet, and there are links on that page that they click on, etc.

The title text refers to the fact that many rely on Wikipedia instead of remembering/learning stuff. Reliance on Wikipedia was later directly addressed as the subject of 903: Extended Mind.

### #334: Wasteland



You make forgetting look so easy.

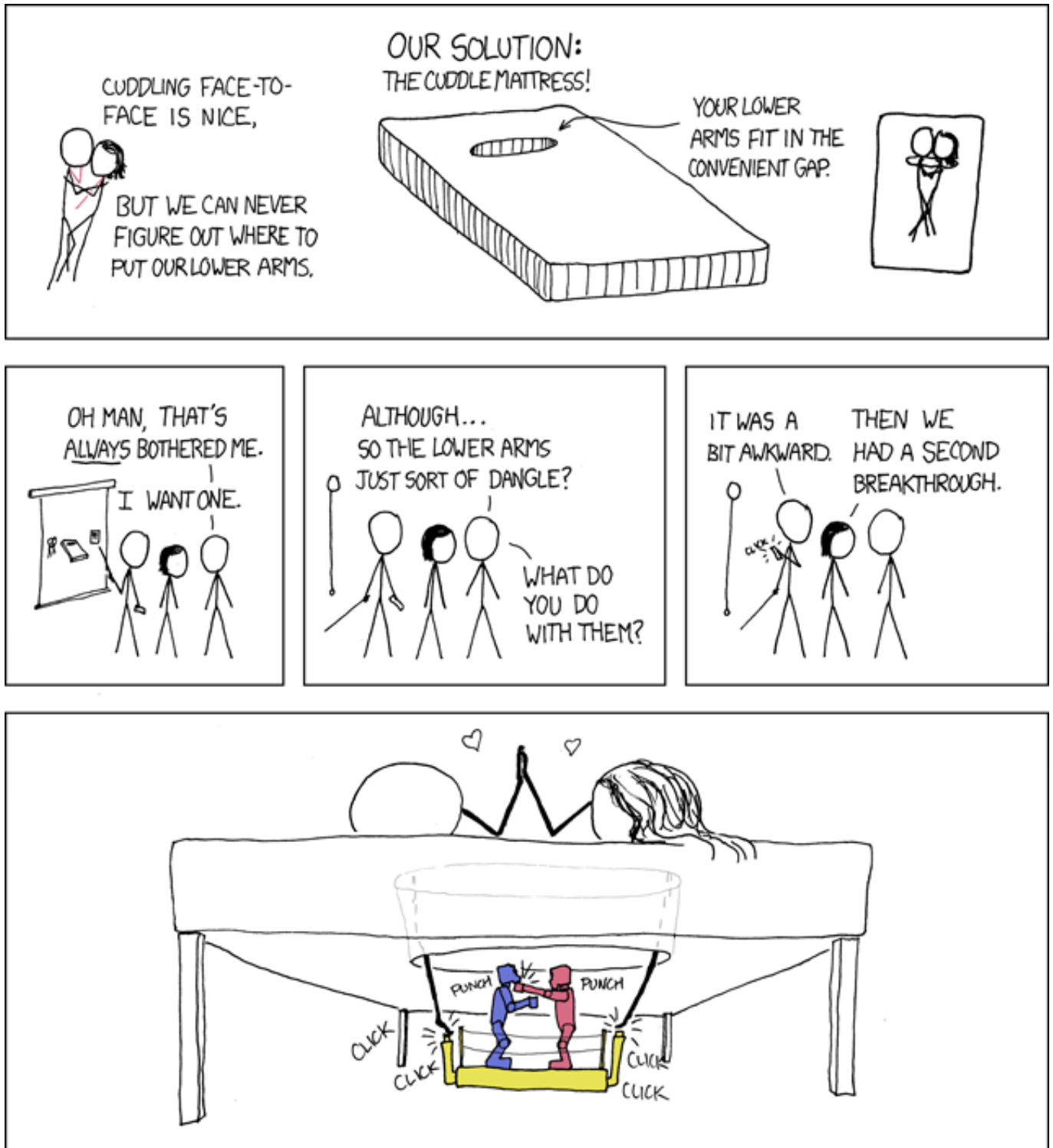
#### **Explanation:**

At the beginning of the comic, Cueball is wandering around in a barren area, supposedly a desert, thinking about his ex-partner, in which he, at first, appears to be fondly remembering them, but the last two boxes explain that he is trying to take a long walk to forget them, and is obviously not very good at it.

The title text implies that his ex-partner had easily forgotten him, and he wishes that he could forget more easily. It's also possible that he means that it's so hard to forget them that forgetting anything else is simple in comparison to it.

There is a similar twist in comics 71: In the Trees and 1042: Never.

### #335: Mattress



The TempurPedic wineglass guy broke his ankle.

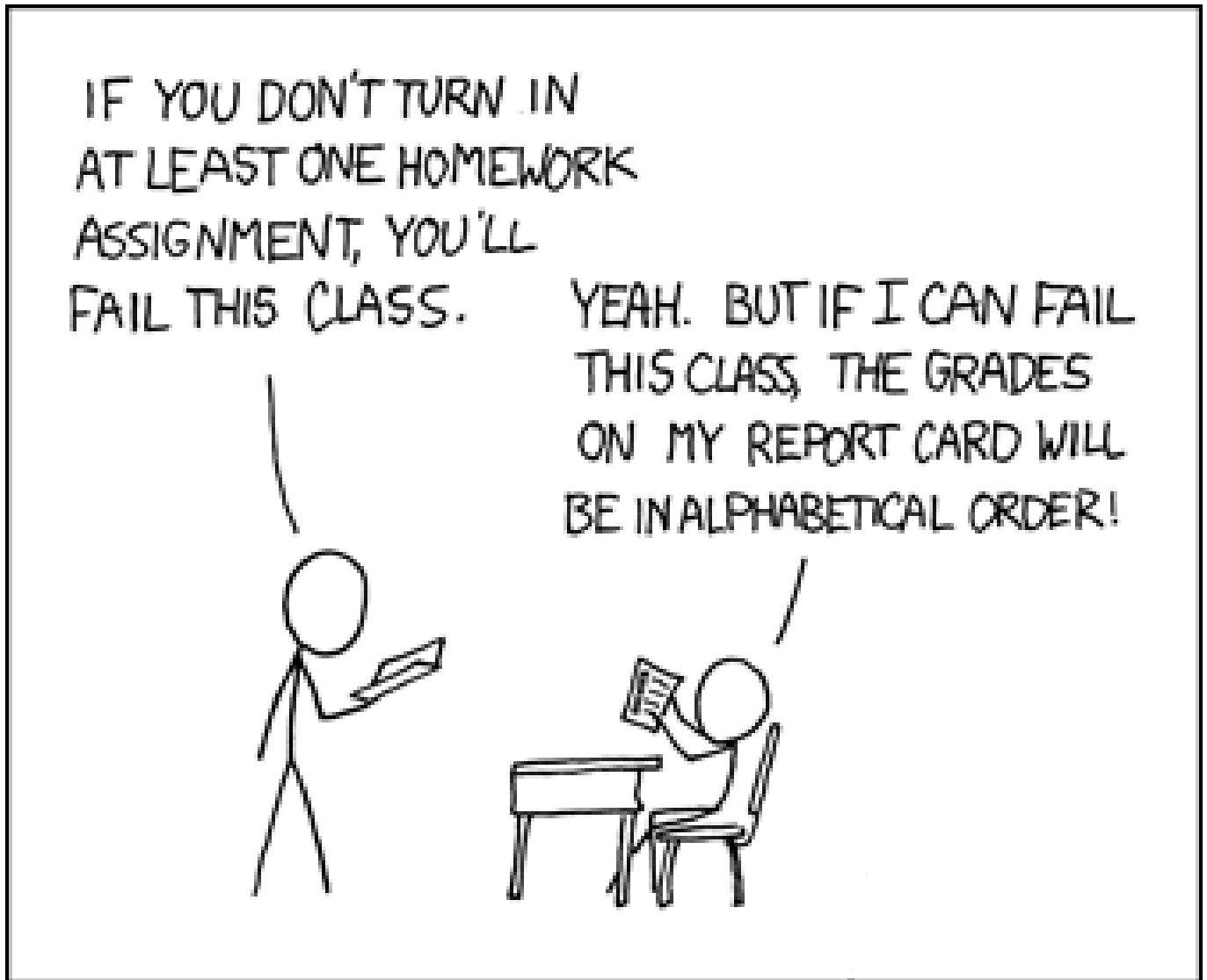
#### Explanation:

A commonly cited problem with cuddling is that whatever arms you and your partner are lying on tend to fall asleep from your and/or your partner's weight, and are in any case not very comfortable to be lying upon. Here Cueball and Megan have invented a mattress with a slot in it to solve that problem. To provide an activity for their lower arms when they are comfortably placed in that slot, they have installed a game of "Rock

'Em Sock 'Em Robots" underneath the bed.

The humor arises from the juxtaposition of a sedate activity like cuddling with a boisterous activity like "Rock 'Em Sock 'Em Robots" with the implication that Megan and Cueball are doing both at once.

The title text refers to a series of commercials for Tempur-Pedic mattresses where the presenter would place a wine glass on the mattress and then jump up and down somewhere else on the mattress. The fact that the wine did not spill was meant to indicate that one partner's motions would not disturb the other. It is implied that he did that test on this mattress and fell into the slot, breaking his ankle in the process.



You should start giving out 'E's so I can spell FACADE or DEFACED.

### Explanation:

In this comic, Cueball is a student, who apparently didn't turn in his homework assignment repeatedly, for which he gets a warning from his Cueball-like teacher.

In some schools in the United States, a student's grades are determined mainly using letters for quick reference. In most schools, the letter grades are given as follows:

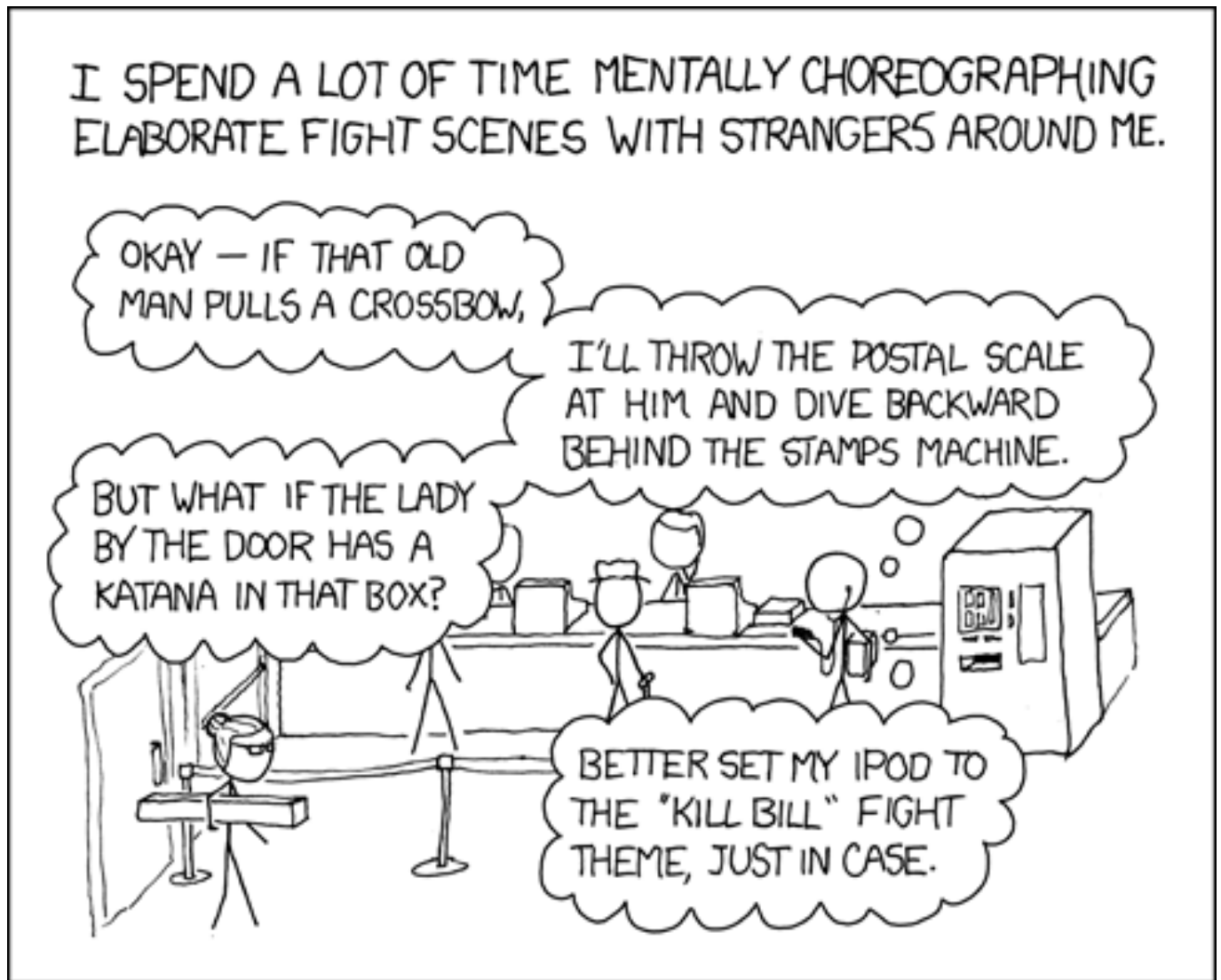
Traditionally, these schools send 'report cards' in which the student's current grading of the semester or even the entirety of the class the student is taking is denoted using these letters, for example:

The student may have noted that, if he aims for certain scoring (for example: altering the quality of his homework or even sending out his homework only at the times needed for his grades to reach a certain level), he could make the report card spell every letter grade in alphabetical order. Deriving from the previous example, the student would aim for the following report card:

Interestingly, since in some schools even a 0% grade would produce the required 'F' grade, the student does not need to work at all (not even turn in any school assignments) to get the required 'F' grade, this leading to the situation presented in the comic above. Rather than a letter upon a continuum (as it might be assumed if 'E' were not skipped) it is generally accepted that 'F' actually stands for 'Failed' and covers any situation where insufficient credit was gained to obtain any other letter-grade. There are some schools, though, where turning in nothing would result in the class being marked "incomplete" or "inc" instead of having a grade shown at all.

The title text references that, not only can the grades in the report card inadvertently spell out certain words (for example: 'CAB' or 'FAD'), but also that the letter grade system denoted omits the letter 'E' in standard letter grading. The reason for the missing "E" is complex and explained in this Slate article. However, this is not universal in the United States: Harvard University and Ohio State University, for example, use 'E' for failing.

### #337: Post Office Showdown



That track ('Battle Without Honor or Humanity') -- like 'Ride of the Valkyries' -- improves *any* activity.

#### Explanation:

Action movies, such as "Kill Bill" by Quentin Tarantino, sometimes feature elaborate fight scenes in mundane environments. In such environments, combatants may make use of everyday objects for defensive or offensive purposes. In this comic, Randall, represented by Cueball, explains that he often daydreams fantasy scenarios in which he is involved in such a fight, and that the strangers around him are his opponents. This references another trope in action and spy movies, where enemies dress in ordinary clothing and conceal or stash weaponry in order to ambush the hero, forcing them into an immediate and deadly fight for which they are unprepared.

First, Cueball imagines that the old man (an old version of White Hat with a cane) pulls out a crossbow, and that his response would be to throw the postal scale at him. This would be an effective countermeasure if Cueball could pull it off, but it may not be feasible - postal scales are usually quite heavy, and assuming that the crossbow is already ready to fire, it would likely be faster for the man to pull the trigger than for Cueball to lift and throw the scale. Additionally, if it is an electronic scale, it is probably plugged in,

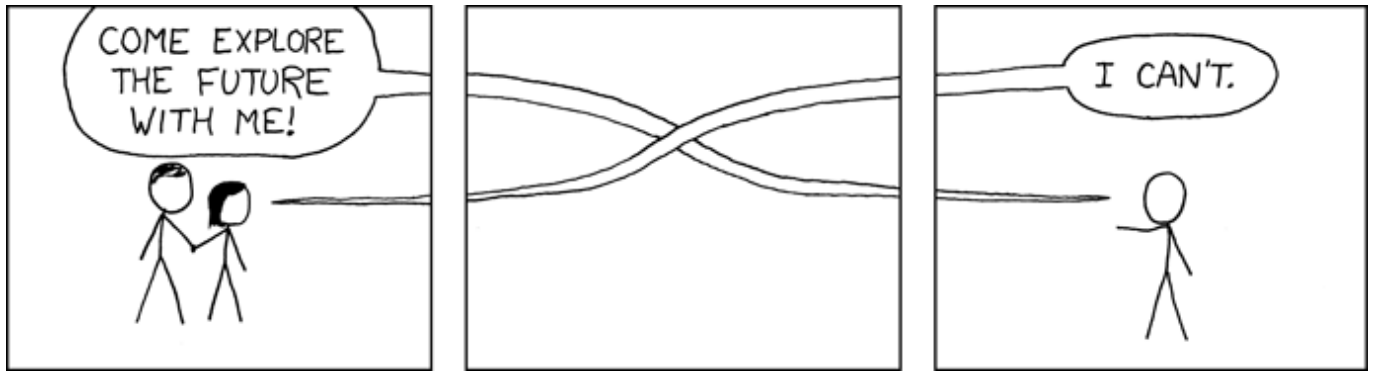
which would prevent Cueball from easily removing it.

Cueball's next action would be to dive backward behind the stamps machine. This would be a good place to take cover, as the stamps machine is large and heavy and may be able to block a crossbow bolt or other fire. He then considers that the old lady (Hairbun) may have a katana, a Japanese sword, in the box she is carrying (and apparently preparing to mail). The box does indeed look the correct size and shape to fit a katana, although it is unlikely that an old lady would own one or need to mail one. Nonetheless, Cueball readies his iPod to play the Kill Bill fight theme in anticipation. Katanas featured heavily in Kill Bill, and the centerpiece of the first movie is a long fight scene with dozens of fighters armed with katanas. Cueball is presumably anticipating a similarly extended and overblown fight. This comic's premise is similar to the My Hobby series, in which Randall expounds on his various hobbies of dubious utility.

The title text refers to two songs: "Battle Without Honor or Humanity" from the soundtrack of Kill Bill and "Ride of the Valkyries" by Richard Wagner, the latter being associated with battle scenes because of a famous sequence in the movie "Apocalypse Now" by Francis Ford Coppola. He notes that these two songs will absolutely improve any activity, not only fight scenes.



### #338: Future



But the past was much too cramped!

#### Explanation:

Cueball is in the last panel (the future) but somehow manages to get his message into the first panel (the past). Megan answers in the first panel, but somehow her message gets to Cueball in the last panel.

This comic can be interpreted in several ways. First, it is not clear if Cueball's question is intended for Megan alone, for Hairy alone, for both Megan and Hairy, or at the past world in general. If the question is intended for several people, the comic is just about how one could sometimes desire to know the future without waiting for it; however, time flows at its usual rate, and there's no way around this.

If the question is intended only for Megan, it likely means Cueball is asking Megan to become his girlfriend. She answers she can't, maybe because, as before, time runs at its usual rate and she can't go faster; or maybe because she's already with Hairy (they're shown holding hands), and she's not leaving Hairy for Cueball.

Finally, the Cueball in the future could just be the very same person as the Hairy in the past, having become bald as he gets older. In this scenario, Cueball is just missing Megan, who was with him in the past but no longer is, maybe even because she has died in between.

In the title text, Cueball seems to be considering going back to the past, but he rejects doing so because, having seen the future, now the past doesn't look attractive.

### #339: Classic



Someone get that Pachelbel's Canon kid a recording contract, stat.

#### Explanation:

Cueball listens to the song "Stairway to Heaven" performed by Led Zeppelin using an old phonograph. Led Zeppelin was active during the 1970s, with Stairway To Heaven being released in 1971; as such, the music belongs to the Baby Boomer generation. After the song fades out to the end, he expresses how much it's affected him by stating that the baby boomers are winning over his own generation at music. The way in which the lyrics are written evokes the sound of this particular song as it finishes and fades out.

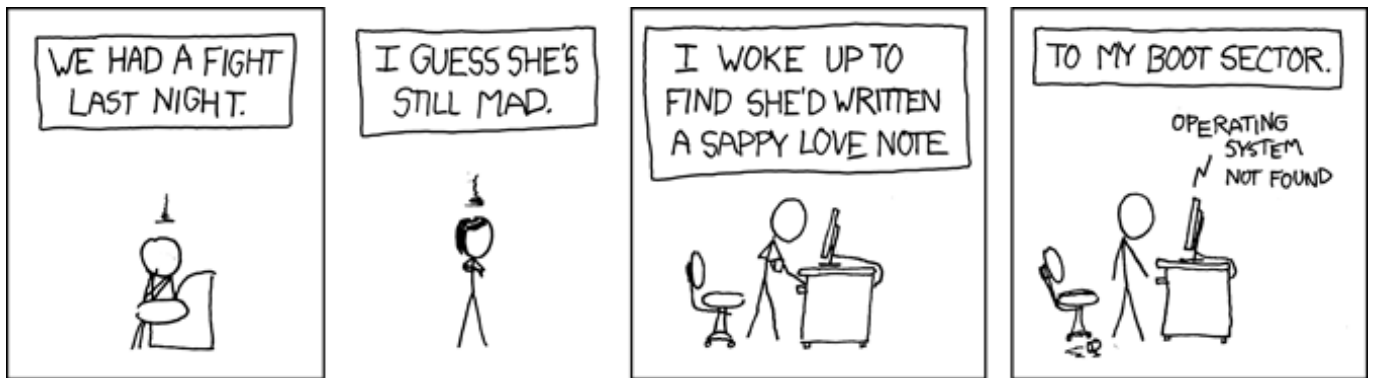
The title text likely refers to Lim Jeong-hyun, the guitarist in the YouTube video guitar that went viral in 2006-2007, in which he performed a cover of "Canon Rock," a rock arrangement of Pachelbel's Canon. Alternatively, it may refer to JerryC, the original composer of "Canon Rock," who also performed the song in a YouTube video, though his video did not gain as much popularity as Lim's.

The Classical era was a period in music history (1750 - 1820) that produced many musical compositions still remembered hundreds of years afterward, and the word 'classic' is now used to describe something that remains popular long after its time. The "Baby Boomer generation" is known for having created many musicians still well-loved today, including:

- Led Zeppelin
- The Who
- Deep Purple
- Genesis
- The Doors
- Pink Floyd
- Janis Joplin
- Jimi Hendrix
- The Rolling Stones

- Stevie Ray Vaughan
- Creedence Clearwater Revival
- Grateful Dead
- The Beatles
- Yes
- ...

### #340: Fight



And she put sweet nothings in all my .conf files. It'll take me forever to get X working again.

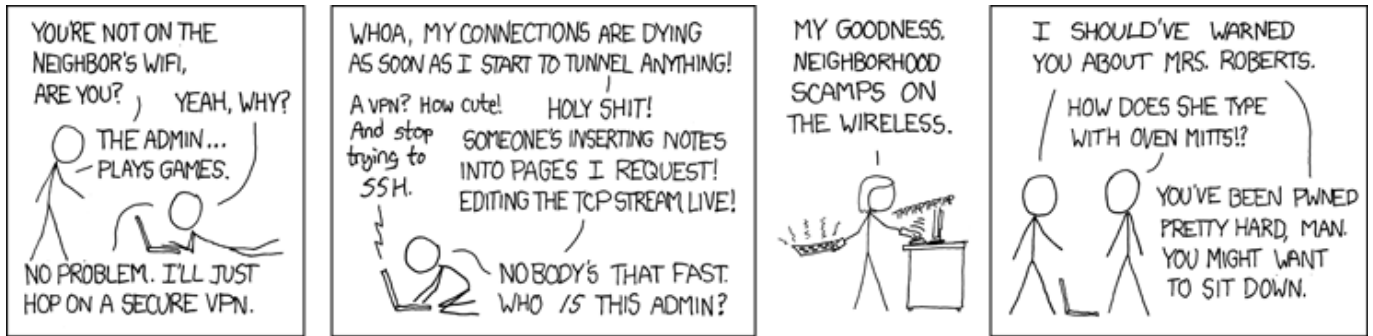
#### Explanation:

The boot sector of a hard drive is where the information for operating systems is stored. It tells the computer to load a program; in most cases, this is an operating system. If this sector is overwritten, an operating system stored on the drive can't be booted into. (Fortunately, repairing a blanked or corrupted boot sector is surprisingly easy, although doing so usually requires the system to be booted from the installation media for the operating system on the drive.)

The first two panels indicate that Megan is still mad at Cueball from a fight from the night before, and the third panel shows promise of her forgiving him through an overly affectionate love note. However, the last panel reveals that she used the love note to overwrite the boot sector of Cueball's computer out of anger.

The .conf files of Linux- and Unix-based systems are text based files where all the settings for various applications are stored. Since all the configurations were replaced with "sweet nothings" - whispered lovers' talk, or literal nothings (blank space or meaningless jumbles of characters) - none of the programs work as they should. X is the X Window System, the most common GUI framework used on modern Linux and Unix systems. Once upon a time, it was notoriously hard to configure correctly, even when starting from a known good configuration, let alone a destroyed one. (More recent versions of X configure themselves correctly for most users without a .conf file.)

## #341: 1337: Part 1



If you're not cool enough to do it manually, you can look up tools like Upside-Down-Ternet for playing games with people on your wifi.

### Explanation:

This is the first part of five in the "1337" series. The title 1337 is "L-eet," or "elite," using the Leet alphabet, a coding system used primarily on the internet (and on early text messaging systems), meant to provide a bit of obfuscation to plain text both to make it harder to read, and to show off in a creative way using in-group jargon.

This series was released on five consecutive days (Monday to Friday) and not over the usual schedule of three comics a week. These are all the comics in 1337 series:

- 341: 1337: Part 1
- 342: 1337: Part 2
- 343: 1337: Part 3
- 344: 1337: Part 4
- 345: 1337: Part 5

If a wireless network (Wi-Fi) is unsecured, it is usually a sign that the owner of the access point is not technically skilled enough to go into the admin panel and enable encryption. Obviously, someone in the area who wants to get on the net, but doesn't have a mobile data connection, will simply use this open access point. However, it is also common practice to leave open an access point to be able to claim that infringement of copyright may not have been the homeowner, but that anybody could have connected to the access point and started downloading files.

Another fun trick, for administrators of open APs, is to intercept pages and edit their contents. The only way to stop this is to create a secure connection, or tunnel, to a server to stop the admin from playing man-in-the-middle. Of course, as the title text says, Mrs. Roberts is so cool, she can edit the TCP stream live, without the help of programs, but then there is help to get with tools like the Upside-Down-Ternet, if you wish to play games with people misusing your Wi-Fi.

Not only is Mrs. Roberts awesome enough to manually edit the live TCP stream, she's also manually ending individual VPN and SSH connections as Cueball's Cueball-like

friend makes them - while wearing oven mitts and baking cookies at the same time. He has been pwned (meaning "owned") by Mrs. Roberts.

The question "How does she type with oven mitts?" is likely a reference to the old web video site Homestar Runner and its character of Strong Bad, who answered emails while wearing boxing gloves. "How does he type with boxing gloves?" was the most common question he received. Another unanswered question is how Cueball's friend knew she was typing with gloves on; however, the answer is probably that since they were neighbours, they could see her through the window.

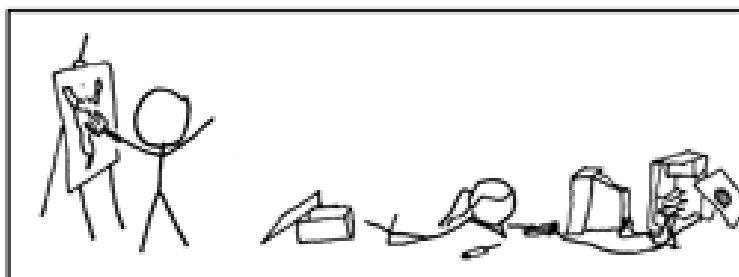
**#342: 1337: Part 2**

SO, THE GREATEST HACKER  
OF OUR ERA IS A  
COOKIE-BAKING MOM?

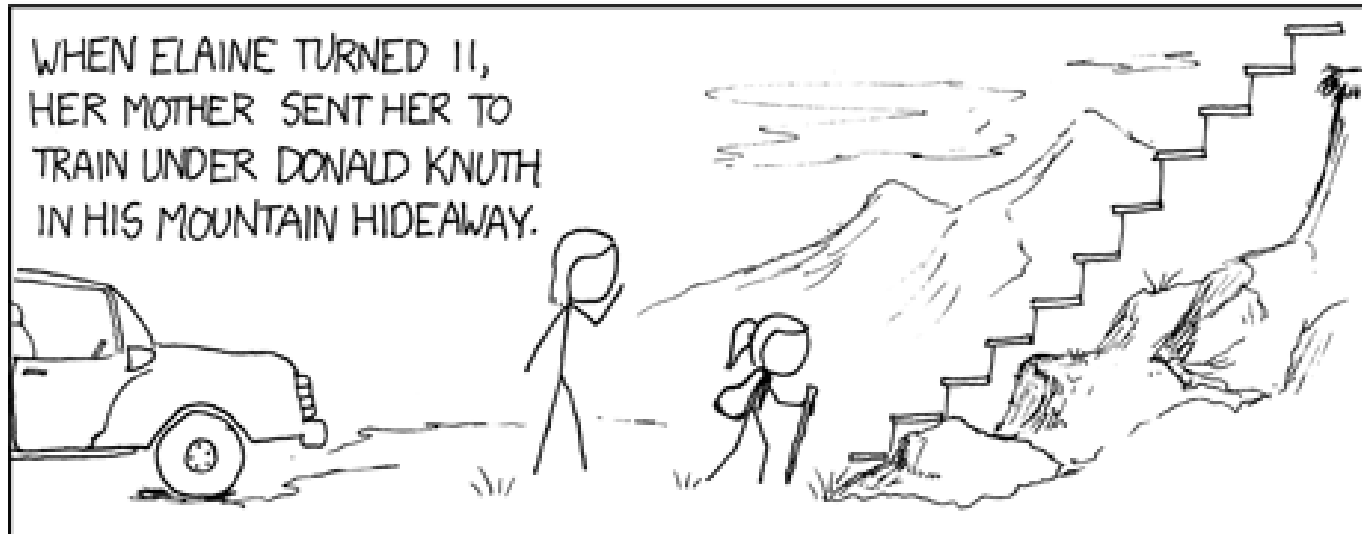
SECOND-GREATEST.



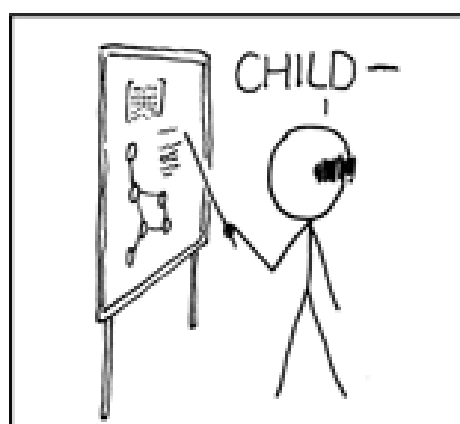
MRS. ROBERTS HAD TWO CHILDREN.  
HER SON, BOBBY, WAS NEVER MUCH FOR  
COMPUTERS, BUT HER DAUGHTER ELAINE  
TOOK TO THEM LIKE A RING IN A BELL.



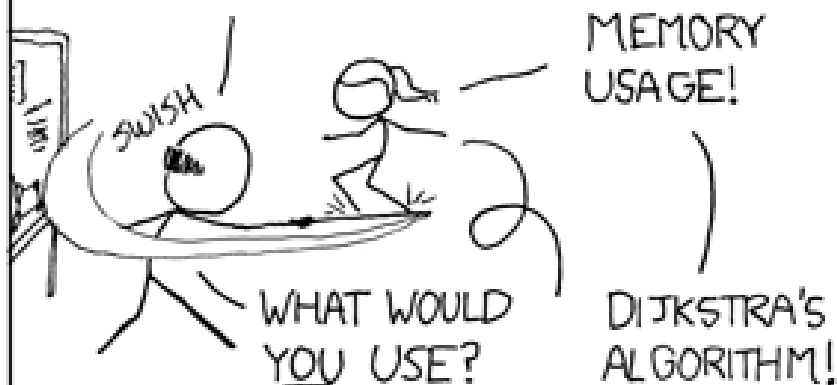
WHEN ELAINE TURNED 11,  
HER MOTHER SENT HER TO  
TRAIN UNDER DONALD KNUTH  
IN HIS MOUNTAIN HIDEAWAY.



FOR FOUR YEARS SHE  
STUDIED ALGORITHMS.



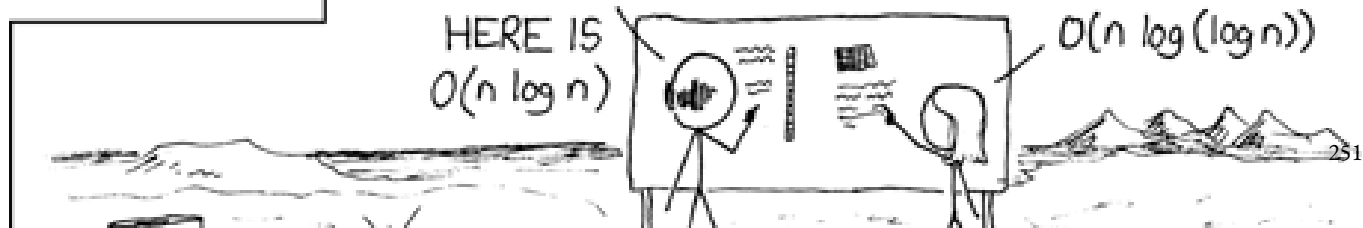
WHY IS A\* SEARCH WRONG  
IN THIS SITUATION?



UNTIL ONE DAY  
SHE BESTED  
HER MASTER

SO OUR LOWER  
BOUND  
HERE IS  
 $O(n \log n)$

NOPE.  
GOT IT IN  
 $O(n \log(\log n))$





Trivia: Elaine is actually her middle name.

### Explanation:

This is the second part of five in the "1337" series. The title 1337 is "L-eet," or "elite," using the Leet alphabet, a coding system used primarily on the internet (and on early text messaging systems), meant to provide a bit of obfuscation to plain text both to make it harder to read and to show off in a creative way using in-group jargon.

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- 345: 1337: Part 5

"Like a ring in a bell" appears to be a reference to the Chuck Berry song Johnny B. Goode, in which Berry describes a young boy (like himself) who becomes a guitar-playing prodigy. The original lyric was "just like a-ringing a bell." Apparently, Elaine Roberts learned to program as quickly, easily, and skillfully as Johnny (and Chuck) learned to play rock 'n' roll.

Donald Knuth is a computer science Professor Emeritus at Stanford University who is famous for writing The Art of Computer Programming and developing the TeX computerized typesetting system. He may not have a mountain hideaway (a reference to Kill Bill, by the way, as is the whole training sequence), but he would be one of the best mentors a budding hacker could have.

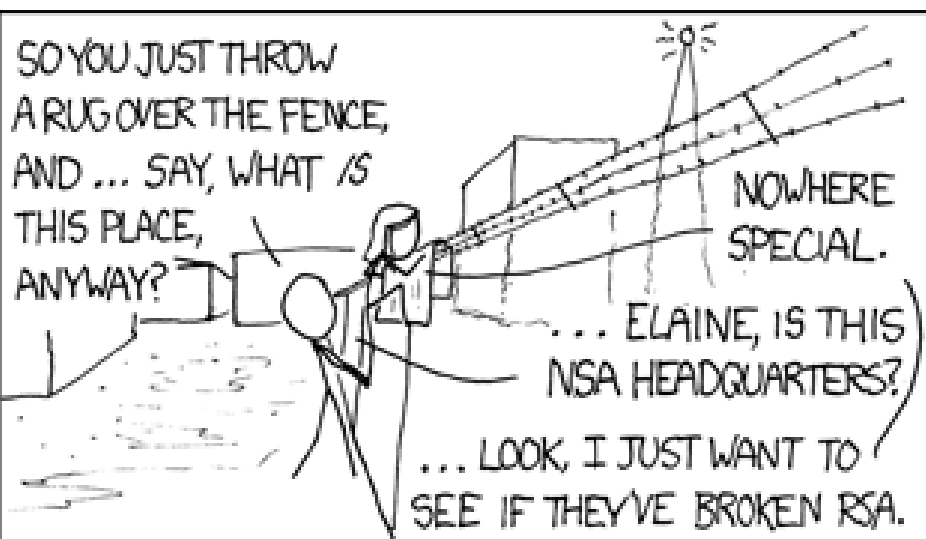
The A\* search algorithm and Dijkstra's algorithm are graph search algorithms. And what study of algorithms would be complete without a healthy study about finding complexities? Time complexity is the amount of time an algorithm takes to execute. Upper bounds for complexity is written in Big O notation. Best possible execution of an algorithm is constant time, or  $O(1)$ , said in words, for any given data set, no matter how large, the algorithm will always return the answer at the same time. However, constant time is extremely difficult to achieve; linear time ( $O(n)$ ) is also very good. For more complex algorithms,  $O(n \cdot \log(n))$  is good, but  $O(n \cdot \log(\log(n)))$  is better. (Note that logarithms in different bases are proportional to each other. So, this would hold true for any base  $> 1$ .)

Knowing that Mrs. Roberts has two children, this daughter named Elaine and the son named Bobby, is the key indicator that this is the mother previously noted as having given her children particularly strange names. Of course, the title text here explains that Elaine is only her middle name (assuming canonicity of title-text), but it was in the title text to 327: Exploits of a Mom that we learned that her first name is "Help I'm trapped in a driver's license factory". Mrs. Roberts appears to have had fun naming her children.

### **#343: 1337: Part 3**

IT WAS THE LATE 90's. ELAINE CRISSCROSSED THE COUNTRY WITH ADRIAN LAMO, THE 'HOMELESS HACKER', LEARNING TO GAIN ENTRY INTO SYSTEMS BOTH VIRTUAL AND PHYSICAL.

SO YOU JUST THROW A RUG OVER THE FENCE, AND ... SAY, WHAT IS THIS PLACE, ANYWAY?

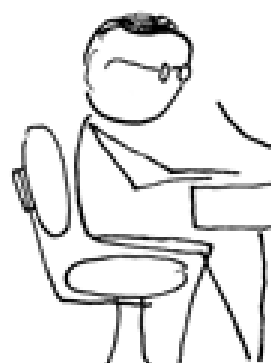


NOWHERE SPECIAL.

... ELAINE, IS THIS NSA HEADQUARTERS?

... LOOK, I JUST WANT TO SEE IF THEY'VE BROKEN RSA.

SHE LEARNED, FROM LAWRENCE LESSIG, ABOUT THE MONSTROSITY THAT IS U.S. COPYRIGHT LAW.



I'M STARTING SOMETHING CALLED "CREATIVE COMMONS" —

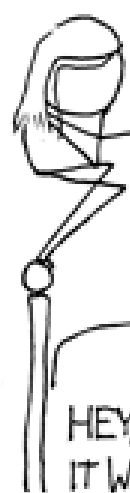
SO, HOW DO WE FIX THE SYSTEM? STAB BAD GUYS?

I THINK WE SHOULD STAB BAD GUYS...



SHINK

SHE MET WITH STEVE JOBS TO DISCUSS THE FUTURE OF APPLE.



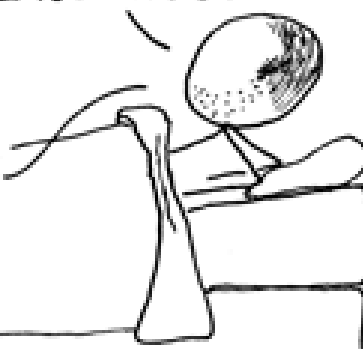
COMPRESSION AND BANDWIDTH ARE CHANGING EVERYTHING.

WHO ARE YOU? IT'S 3:00 AM!

APPLE SHOULD MAKE A PORTABLE MUSIC PLAYER.

I'M CALLING THE POLICE.

HEY, IDEA — INTEGRATE IT WITH A CELL PHONE!



SHE EVEN, FOR A TIME, TOOK UP DRUMMING,



AND HELPED START A MOVEMENT AMONG TEEN GIRLS, A CULTURE OF SELF-TAUGHT FEMALE PROGRAMMERS AND MUSICIANS,



I once asked an NSA guy whether they'd broken RSA. And I know I can trust him, because I asked if he was lying to me and he said no.

## Explanation:

This is the third part of five in the "1337" series. The title 1337 is "L-eet," or "elite," using the Leet alphabet, a coding system used primarily on the internet (and on early text messaging systems), meant to provide a bit of obfuscation to plain text both to make it harder to read and to show off in a creative way using in-group jargon.

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- 344: 1337: Part 4
- 345: 1337: Part 5

The comic is narrated by Cueball as seen in the previous comic, but that Cueball is not shown here, where the man drawn as Cueball is a real person. Adrian Lamo was a hacker known for being a threat analyst and has penetrated many corporate networks. As far as we know, he has not penetrated any government networks, so helping Elaine Roberts physically break into the NSA would probably inspire second thoughts. The use of a rug to cross the barbed wire fence is likely a reference to a scene in *Fight Club*, where the same method is used to break into a liposuction clinic.

RSA (the algorithm) is an encryption algorithm that allows encryption and decryption using separate keys. No efficient method to break RSA is known.[citation needed] But if the NSA knew any such method, it would be unlikely for them to admit that.

However, the NSA have paid RSA (the company) to put a backdoor into one of their encryption schemes. Lawrence Lessig is a political activist focusing on copyright law and intellectual property, as well as a founding board member of Creative Commons. He also briefly ran for president as a Democrat in the 2016 cycle but dropped out before any primaries were held.

Steve Jobs was the two-time CEO of Apple Inc. In partnership with Steve Wozniak, he founded Apple. He oversaw Apple's return from near bankruptcy, the introduction of the original Macintosh, the iPod, the iPhone, and the iPad. But in the '90s, most of this had not happened yet. The comic is implying that it was Elaine, in fact, who planted those ideas in Jobs' mind (while perching on his bedpost, a nearly-impossible physical task for even a relatively small and light human being - such a stance is often depicted for gargoyles or fictional vampires, the latter of which are associated with nocturnal bedroom-invasions like this). Furthermore, Steve's reactions indicate that he was abruptly woken up by Elaine after she broke into his home and started a one-sided conversation with him.

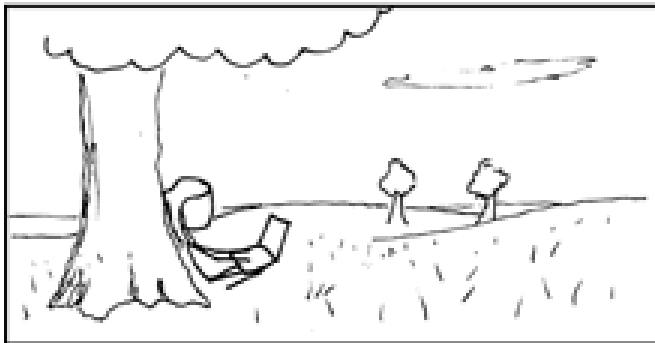
The final panel is a pun on the Riot grrrls - Riot grrrl is an underground feminist punk rock movement. This metamorphosizes in the hands of Randall into Riot Prrl - who

presumably prefer to code in Perl. The real Riot Prll is from Northampton and is into guerilla knitting.

The title text may refer to the urban legend that leads petty criminals to ask each other "Are you a cop?". The bottom line is that anyone who is capable of lying about breaking the RSA encryption algorithm, possibly including the "NSA guy," would be equally capable of lying about whether or not he is lying.

**#344: 1337: Part 4**

AS TIME PASSED, ELAINE INTENSIFIED HER HACKING WORK, ANONYMOUSLY PUBLISHING EXPLOIT AFTER EXPLOIT.



TO CRACK OPEN PROPRIETARY HARDWARE, SHE TEAMED UP WITH ONE OF THE TOP EXPERTS IN SIGNAL PROCESSING AND DATA TRANSFER PROTOCOLS.



HI, MOM. HELLO, DEAR.  
DID YOU HAVE FUN?

THEY WERE AN UNSTOPPABLE TEAM.



I FINISHED THE CSS DECRYPTOR. GOOD, DEAR.  
I'LL SEND IT ALONG TO JON.

AND WERE EVENTUALLY NOTICED.

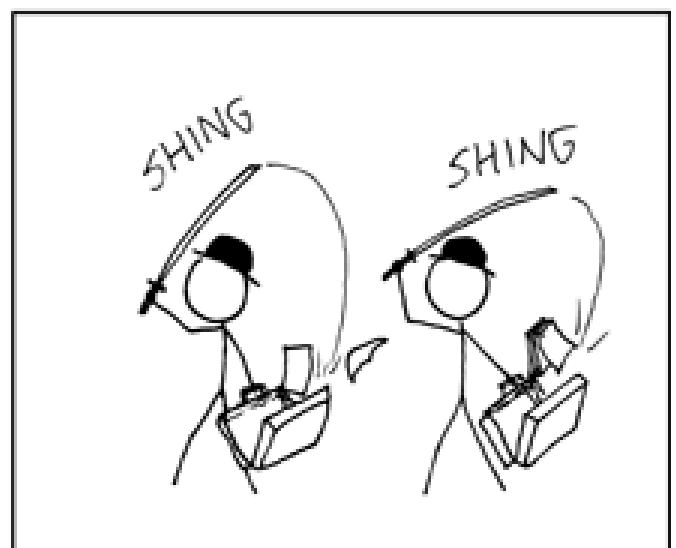


GAME'S OVER. YOU'RE COMING WITH US.



OH, ARE WE?  
NOW NOW, ELAINE—

SHINK



SHING

SHING

DON'T LET THEM PROVOKE YOU, DEAR.

WE DON'T WANT TO HURT YOU, MA'AM.

DON'T BE SILLY.

RECORD COMPANY

EMPLOYEES CAN'T



AH, SO YOU  
HAVEN'T READ  
THE DMCA.

TITLE IV,  
SECTION 408:  
AUTHORIZATION OF  
DEADLY FORCE.



Mrs. Roberts would have gotten up sooner, of course, but she was busy piping find and find nomad into xargs shred, just in case.

## **Explanation:**

This is the fourth part of five in the "1337" series. The title 1337 is "L-eet," or "elite," using the Leet alphabet, a coding system used primarily on the internet (and on early text messaging systems), meant to provide a bit of obfuscation to plain text both to make it harder to read and to show off in a creative way using in-group jargon. The comic is narrated by Cueball as seen in part 2, but that Cueball is not shown here, but still, he is part of this comic series, and thus also this comic.

This series was released on five consecutive days (Monday to Friday) and not over the usual schedule of three comics a week. These are all the comics in 1337 series:

- 341: 1337: Part 1
- 342: 1337: Part 2
- 343: 1337: Part 3
- 344: 1337: Part 4
- 345: 1337: Part 5

In this part, Elaine Roberts returns to the second-best hacker in the world (she is the best, according to 342: 1337: Part 2): her mom Mrs. Roberts. Together, they are an unstoppable force, and they help out a guy called Jon with a CSS decryptor (Content Scramble System, not to be confused with Cascading Style Sheets).

This implies that Jon Lech Johansen's DeCSS was written by Elaine. Jon Lech Johansen, also known as DVD Jon, is famous for DeCSS, a DVD decryption program that removes the copy obstruction from commercial DVDs. The Motion Picture Association of America, also known as the MPAA, was not amused.

Both the MPAA and the Recording Industry Association of America (RIAA) use the Digital Millennium Copyright Act, shortened to DMCA, as a kind of brute club to silence "infringements" on their copyright. In a perfect world, the DMCA provides safe harbor protection to websites and consumers to make fair use of copyrighted content, while also affording copyright owners the ability to protect their works from being pirated. In this world, this means that any content restriction system, no matter how weak and poorly executed, cannot be circumvented, and discussion of circumvention is illegal as well.

This is not a perfect world,[citation needed] and in the end, the Roberts team is noticed. Two men with black bowler hats and briefcases with the abbreviations MPAA and RIAA show up at their house to arrest them. The two men look very much like Thomson and Thompson from The Adventures of Tintin, who are (bumbling) policemen/detectives who do not usually attempt violence or wield weapons more dangerous than a standard furled umbrella, but here it more likely depicts the Nebulous Evil Organization's corporate variation upon the Men In Black.

While Elaine is not ready to let them arrest her, she draws her knife, and they draw their



katana swords out of their (way too short) briefcases. Mrs. Roberts says to her daughter that she should calm down, because it is illegal to slice people up in their own houses.

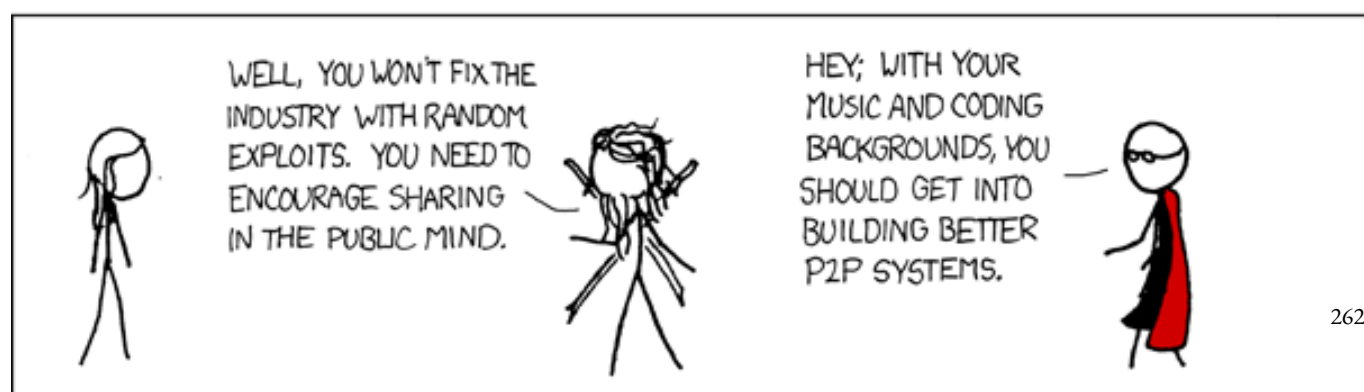
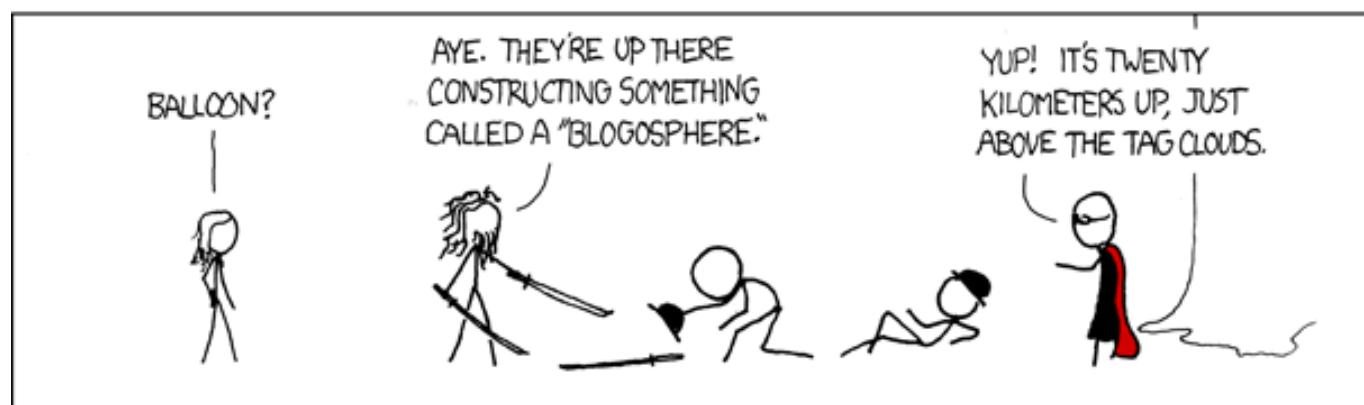
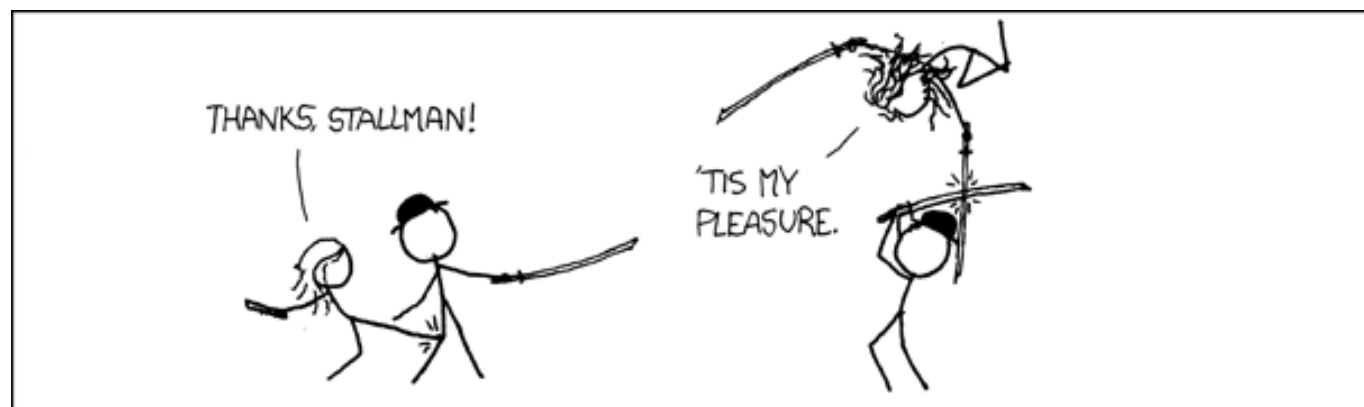
However, the two men disagree and refer to the DMCA Title IV, Section 408: Authorization of Deadly Force (non-existent, as Title IV ends with Section 407). So now the two women are in lethal danger.

But of course, Richard Stallman, founder of the GNU Project and stalwart defender of freedom and copyleft, cannot stand for this kind of repression of freedom. (In the real world, Stallman is not a swordsman, but he is always depicted with two katana swords in xkcd, first time was in 225: Open Source.) In keeping with the "Kill Bill" themes from earlier in the series, Randall imagines the conflict between Elaine/Stallman/Mrs. Roberts vs MPAA/RIAA agents as an action-packed katana battle, rather than the legal battle it would likely have been in real life.

The title text is talking about a Linux-ism. In GNU/Linux (and all Unix derivatives), ~ is a symbol for a user's home directory (usually /home/<username>). Presumably, "nomad" is Elaine's username. find is an application that recursively walks a filesystem, listing all files, and xargs shred takes those files and securely erases each one with pseudo-random data. This is different from simply deleting a file, which merely removes the pointer in the filesystem's record tables to the file's location on the hard disk. The latter can usually be recovered from. Secure delete, however, requires physically taking apart a disk and reading individual bits for remaining magnetic charge to attempt to reconstruct what was there. This means she was trying to permanently delete her and Elaine's files, presumably so the agents wouldn't have any proof of their hacking.

Proprietary hardware is hardware (the electronics part rather than the software) created and used only by that company, as opposed to open hardware, which uses parts or chips common to everyone. Proprietary hardware used to be found in most gaming consoles and Apple/Mac devices, but that isn't as common now, since the cost of designing your own hardware is too expensive compared to using common chips.

**#345: 1337: Part 5**



This digital music thing will probably reach its endgame sometime in the next decade or so. These are very exciting times.

## Explanation:

This is the fifth and last part of five in the "1337" series. The title 1337 is "L-eet," or "elite," using the Leet alphabet, a coding system used primarily on the internet (and on other early text messaging systems), meant to provide a bit of obfuscation to plain text both to make it harder to read (and potentially 'grep' for incriminating terms) and to show off in a creative way using in-group jargon. The comic is narrated by Cueball as seen in part 2 comic, but that Cueball is not shown here, but still he is part of this comic series, and thus also this comic, as he narrates the epilogue.

This series was released on five consecutive days (Monday to Friday) and not over the usual schedule of three comics a week. These are all the comics in 1337 series:

- 341: 1337: Part 1
- 342: 1337: Part 2
- 343: 1337: Part 3
- 344: 1337: Part 4
- 345: 1337: Part 5

Richard Stallman is the ardent defender of freedom and believer in copyleft; he also founded the GNU Project. (He is not really a sword fighter but is always depicted with swords when featured in xkcd, which is in this series and in 225: Open Source). In the previous part, he came to the rescue of Mrs. Roberts and her Daughter Elaine Roberts. Stallman and Elaine quickly overpower the two enemies with black bowler hats who represent the Motion Picture Association of America (MPAA) and the Recording Industry Association of America (RIAA), use the Digital Millenium Copyright Act who had found out about the Roberts hacking.

Just when the two men have been defeated, Elaine asks how Stallman knew they were in trouble, and he tells it was his friend who told him about it. Climbing down a rope from the sky, the friend enters with a red cape and goggles. It turns out it is Cory Doctorow, a blogger, journalist, and science fiction author who serves as co-editor of the weblog Boing Boing. He is an activist in favor of liberalizing copyright laws and a proponent of the Creative Commons organization. He does not really travel around in a balloon or (usually) wear a red cape, but Randall introduced this idea in 239: Blagofaire and has continued it in later comics featuring Cory Doctorow. So he is climbing down from his balloon. He uses the balloon to construct the Blogosphere, which is a name used to refer to all blogs on the Internet, many of which frequently link to and refer to other blogs. Here, the Stallman character talks about it as though Cory Doctorow actually constructs it, as if it were a portion of the atmosphere 20 km up over the tag clouds.

Blogs often label posts with keywords, known as tags. A tag cloud is a way of displaying the tags on a site where the more common tags appear in larger type than less-common ones. It has no relationship to actual water vapor clouds in the sky, but in the comic, the Doctorow character suggests that tag clouds are actually in the air, below the new

blogosphere. At this point we see that Mrs. Roberts is still programming while this fight and discussion take place. Her son Little Bobby Tables comes and tells her he is hungry, but she tells him that she does not have time when she is coding, and that he ate yesterday. It seems that he is still a kid, even though it must have been some years since the young Elaine left and grew up. However, she may still be a very young adult, in which case her little brother could still be shorter than his mom (we see in Part 2 that, from age 11, she studied with Donald Knuth for four years, making her 15 when she left. However, it is not clear how long she was away from home after that).

Stallman gives Elaine a proposal to join GNU as a coder. GNU is supposed to be the pinnacle of free software; an operating system with no restriction, allowing the user to modify and customize anything they want about the computer. Stallman likely wants Elaine for her coding abilities, similar devotion to free software, and use her reputation as a hacker and open-source pioneer to spread the word and further his project. This may also be a reference to the infamous "Free Software Song", sung by Stallman in which he exhorts hackers to "join us now and share the software." But she is not ready yet, as she wished to take down the industry of MPAA and RIAA as Music doesn't need these assholes. In the meantime, Cory Doctorow throws the bowler hat guys out and orders them never to "darken our comment threads again."

Stallman is against her idea of going for straight war with the industry and suggests that she help encourage sharing in the public mind. And then Doctorow chimes in with a suggestion that she has the ability to build better P2P systems, to which she asks if they mean straight up piracy. And this leads up to the punch line of the series, when Doctorow says she (i.e. "[Ms] Roberts"), would make a wonderful Dread Pirate! Peer-to-peer, often abbreviated P2P, is a network system where tasks are partitioned between participants with equal privileges, in contrast with the client-server model, where the client makes requests, and the server provides service. A common example of a peer-to-peer system is the BitTorrent file-sharing protocol, which is often (mis)used for distribution of pirated software and media.

The Dread Pirate Roberts is a fictional character from the book and movie *The Princess Bride*. Roberts is the most feared pirate on the seas. But, "Dread Pirate Roberts" is merely a title that has been passed down as previous "Roberts" have gained enough money (from piracy) to retire comfortably. Westley, one of the main characters from *The Princess Bride*, becomes the Dread Pirate after being taken prisoner by the preceding Pirate Roberts. It is anyone's guess whether the entire 5-comic story, starting from the choice of Mrs. Roberts' name, began as just a lead-up to this one joke. At the end of the movie, Inigo Montoya has won the vengeance he has sought all his life, and expresses to Westley that he doesn't know what to do next. Westley suggests Montoya succeed him as Roberts, saying, "Have you ever considered piracy? You'd make a wonderful Dread Pirate Roberts." Cory Doctorow's line in the comic therefore mimics that line from the movie.

Silk Road was an online illegal market designed to allow criminals to trade in drugs, guns, and other illegal items, run by a person also using the pseudonym Dread Pirate Roberts. However, this illegal market did not exist until four years after this comic was published. In the epilogue, several items of interest are revealed about the Roberts' later lives. Elaine shared her ideas with Bram Cohen, who went on from that to found BitTorrent, a distributed method of downloading files. People can and do use BitTorrent both for lawful file downloads and also for sharing media files unlawfully. Its distributed nature, where someone does not download a file from just one other computer but rather in many pieces from many other computers with the same file,

makes it more difficult for record and movie industry groups to police, and therefore a person with Elaine's motivations might be interested in helping design such a system.

Mrs. Roberts developed for Ubuntu, which is probably the most well-known distribution of GNU/Linux. A GNU/Linux distribution (often referred to simply as "Linux") is any operating system that is based on GNU software and the Linux kernel. She also went after any website (defacing them) that made Your mom jokes to her daughter (hence being about herself, for which she clearly feels justified to retaliate in her own particular way). To deface a website is like putting up graffiti or tearing down signs; she likely replaces the URL's content from the original site to another image, text box, or other message as revenge. This is a recurring theme on xkcd. Defacing websites is generally considered a low-level hacking activity, generally carried out by script kiddies using pre-packaged exploits rather than by highly skilled hackers like Elaine.

Finally, a bit more info is given on how Elaine continues her fight: she joins random communities, helps with code, and mysteriously moves on. Sometimes she streams her music live on an IP address, and if you happen to find one of these with a streaming audio player, you can hear her rock out (a reference to her music career mentioned at the end of the third part). The final phrase "Happy Hacking" often accompanies an autograph from Richard Stallman.

The title text is likely referring to the argument over Digital Rights Management, or DRM-locked content. These so-called "DRM wars" are concerned about how DRM restricts the freedoms of people who buy them legitimately, and how it restricts creativity and innovation on the Internet. A large part of the debate is digital music, or music you would buy and download on the Internet through sites like Amazon or iTunes. The title text states that the DRM wars will end in the next decade or so, and we are living through exciting times as we can see these wars unfold and eventually end. In 2009, iTunes did remove DRM from any music they sold, which was a huge milestone at the time. Due to the rise in music streaming services (all of which use DRM to keep clients from downloading their songs) in the mid- to late 2010s, this achievement has been made void again.

### #346: Diet Coke+Mentos



The cola+Mentos trick is up there with corn starch+water (vibrating platter optional) in scientific coolness out of common kitchen supplies.

#### Explanation:

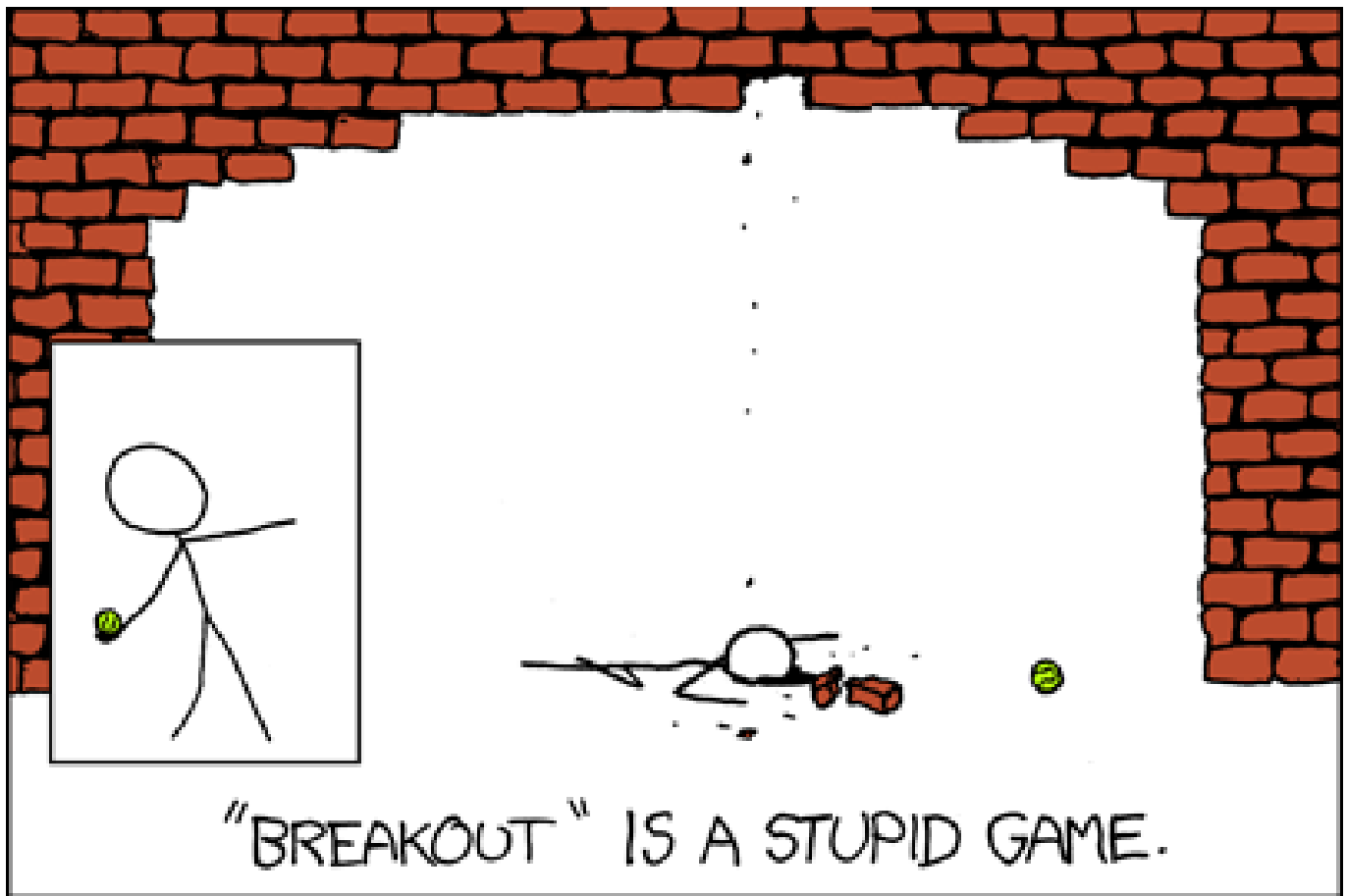
This comic's premise is a reference to the phenomenon of dropping Mentos into a bottle of a carbonate beverage to create a geyser of said beverage. During 2007, a large number of videos depicting this phenomenon floated around the Internet.

Cueball wants to show this phenomenon to his friend, because it's "the coolest thing". However, instead of achieving the standard result, a geyser of Diet Coke, the friend's father magically appears (presumably from the dead or from abandonment).

An alternative interpretation is that the friend's father is resurrected/returned in an event unrelated to the geyser, undermining the geyser's coolness.

The title text shows that Randall considers (or at least then considered) this trick to be as cool as mixing corn starch and water to make a non-Newtonian fluid that reacts wildly with vibrations and impact.

### #347: Brick Archway



The TI-86 was bad enough. I don't know how I'd have gotten through high school if I'd had a laptop+wifi.

#### Explanation:

Breakout is a video game first created in 1976, and since then it has gained much popularity and has been recreated in many different versions. In the game, the player controls a horizontal 'bat' at the bottom of the screen to make it move left or right. Above it are several layers of bricks that are destroyed when hit by the ball. The ball is not affected by gravity and will float around, bouncing off the walls, bricks, and the bat. The aim of the game is to keep the ball from touching the bottom of the screen (by deflecting it with the bat) long enough for the ball to hit and destroy all of the bricks.

Cueball's approach to the game is to actually stand underneath a brick archway and throw a tennis ball at the structure above him in an attempt to destroy the bricks. Naturally, the physics in the game don't work in real life,[citation needed] and the aftermath of Cueball's actions is that one of the bricks in the archway comes loose and falls onto Cueball's head, causing possibly fatal damage.

The sentence at the bottom of the comic points out the illogical nature of the game when compared to real life.

The title text relates to a programmable calculator from the late 1990s that could have a Breakout-like game easily programmed into. This calculator, and others like it, were a requirement in many high school advanced math classes in the United States after the



early 1990s, despite costing over \$100. Randall speculates that, given the amount of distraction this simple game provided him back then, he would not be able to focus on study at all with modern technical instruments like laptops using wireless LANs.

### #348: Close to You



We should probably talk about this before the wedding.

#### Explanation:

This is Randall's version of the popular Carpenters song, "(They Long to Be) Close to You." The actual first verse goes like this:

In this parody, the reason birds suddenly appear whenever the girl is near is because the girl is a zombie, and those are turkey vultures, carrion birds that prey on the flesh of dead bodies.

The title text is joking about couples not discussing their relationship before their wedding, as is seen here.

## #349: Success

AS A PROJECT WEARS ON, STANDARDS  
FOR SUCCESS SLIP LOWER AND LOWER.

0 HOURS



OKAY, I SHOULD  
BE ABLE TO DUAL-  
BOOT BSD SOON.

6 HOURS

I'LL BE HAPPY IF I CAN GET  
THE SYSTEM WORKING LIKE  
IT WAS WHEN I STARTED.



10 HOURS

WELL, THE DESKTOP'S A LOST CAUSE,  
BUT I THINK I CAN FIX THE  
PROBLEMS THE LAPTOP'S DEVELOPED.



24 HOURS

IF WE'RE LUCKY, THE SHARKS WILL STAY  
AWAY UNTIL WE REACH SHALLOW WATER.

40% of OpenBSD installs lead to shark attacks. It's their only standing security issue.

### **Explanation:**

This comic refers to a common experience in which attempts to improve or change something can get you into even worse trouble, and where just getting back to the state at which you started becomes an arduous or even impossible task. Here, this idea is taken to a ridiculously (and amusingly) extreme level, where the attempt to install an operating system snowballs into ever more complicated problems, resulting in Cueball and Megan somehow literally getting themselves in deep water.

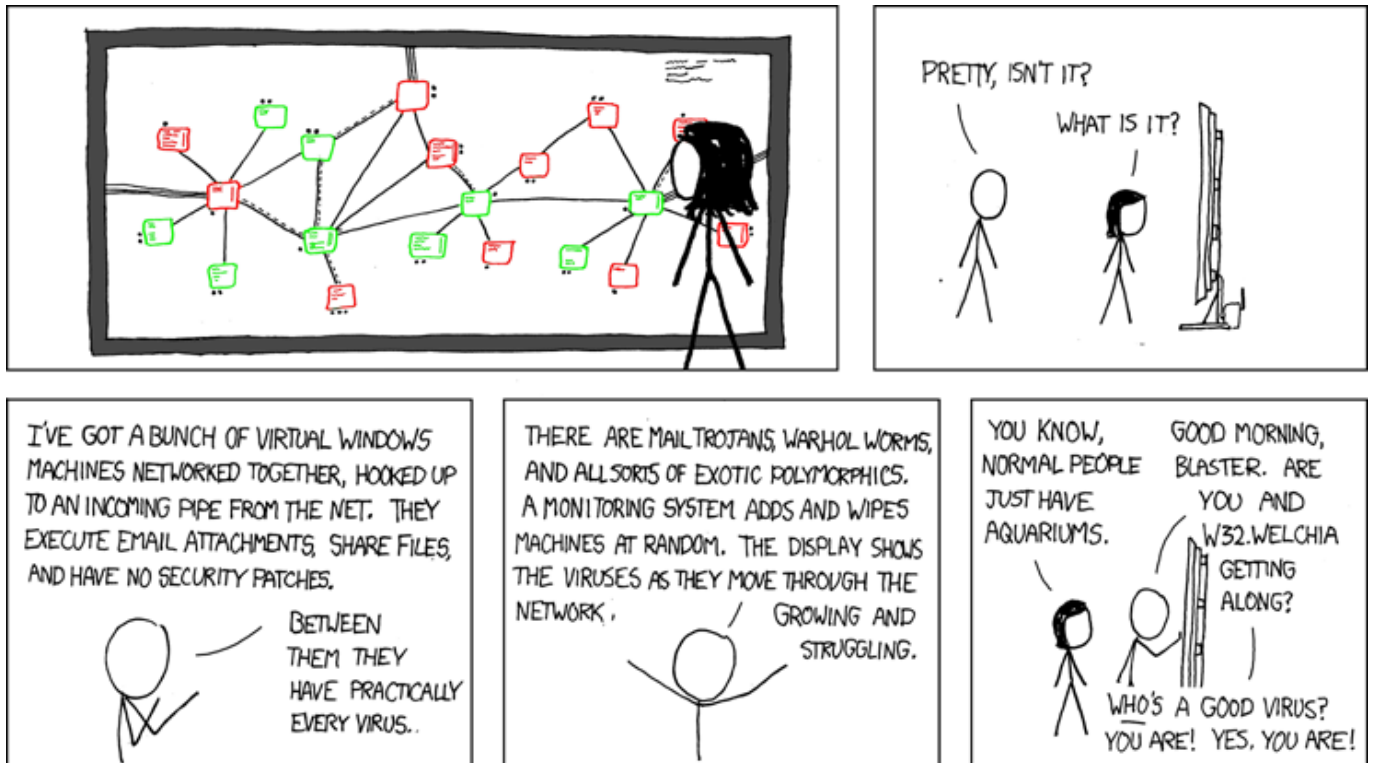
The OS they are trying to install is OpenBSD, an open source Unix operating system that, like some other Unix variants, is notoriously difficult to install and configure correctly, especially on home desktops with less common hardware profiles, and especially compared with the more popular Windows operating system.

The title text is a reference to OpenBSD's premium on security. For a time, their slogan was "Five years without a remote [security] hole in the default install!" This was eventually changed to "Only two remote holes in the default install, in a heck of a long time!" That their only standing security issue would be shark attacks is effectively an acknowledgement that any attempts to install the OS will only lead to getting stranded in the middle of the ocean.

This comic was referenced later in 1350: Lorenz. Trying to install BSD was also referenced in 518: Flow Charts. The last panel in 1912: Thermostat may explain how this comic ended. Later, another possible reason to ending up in the ocean was given in 2083: Laptop Issues.

This comic follows a similar storyline to 530: I'm An Idiot and 1518: Typical Morning Routine, as Cueball and Hairy encounter an issue and attempt proceedingly more absurd solutions to the issue.

## #350: Network



Viruses so far have been really disappointing on the 'disable the internet' front, and time is running out. When Linux/Mac win in a decade or so the game will be over.

### Explanation:

Cueball shows off his virtual fishtank of virus-infected virtual Windows machines to Megan. The machines nominally have mail trojans, Warhol worms, all sorts of polymorphic viruses, and explicitly Blaster and w32.welchia. Cueball relates to the viruses as though they are fish, and hopes that they are all getting along together nicely. This is because part of welchia's payload was to remove the Blaster Worm and attempt to download Microsoft security patches, effectively destroying it and preventing further infection from Blaster.

A computer network or data network is a telecommunications network that allows computers to exchange data. In computer networks, networked computing devices exchange data with each other using a data link. The connections between nodes are established using either cable media or wireless media. The best-known computer network is the Internet.

Network computer devices that originate, route, and terminate the data are called network nodes. Nodes can include hosts such as personal computers, phones, and servers as well as networking hardware. Two such devices can be said to be networked together when one device is able to exchange information with the other device, whether or not they have a direct connection to each other.

Computer networks differ in the transmission medium used to carry their signals, the communications protocols to organize network traffic, the network's size, topology, and organizational intent.

It would be possible to set up a virtual fish tank as described. The main issue would be to make sure that you don't accidentally let anything escape from the fish tank. Consider it like a smallpox lab. Also, some viruses are quite malicious[citation needed] and will prevent a computer from running normally, or at all. An aquarium of dead computers would not be very interesting to watch.[citation needed]

The first part of the title text refers to the difficulty viruses have in the common doomsday threat of "disabling the internet" as a whole, although SQL Slammer had some brief success. The second part of the title text indicates that Randall believes A) that Linux and Mac OS X are inherently less vulnerable to virus attacks than Windows, and B) that Windows will become less important and disappear, so the virus writers had better get their act together soon.

It is not certain how justified this opinion is. Fifteen years after this comic was written, Windows still dominates the desktop, and Linux and OS X are not that much harder to attack with viruses. A side issue is the wild growth in 'smart devices' connected to the internet, powered by non-traditional operating systems such as iOS and Android. Desktop operating systems such as Windows, Linux, and OS X are all becoming less relevant (although note that Android is based on the Linux kernel and iOS is based on OS X), so both the operating system war and the struggle against computer viruses are still "anyone's game."

A similar system to the one described by this comic was available online at <http://wecan.hashte.technology>. It was last reported to be available online on June 29, 2014, but is no longer available.

Instead of executing email attachments, the 7 VMs ran files uploaded via the site by the public, making it more of a public playground aquarium than a private fish tank. Instead of wiping machines at random, each VM runs a virus scanner every 24 hours.

## #351: Trolling



### GREAT MOMENTS IN TROLLING: RICK ASTLEY IS SUCCESSFULLY RICKROLLED

And I was really impressed with how they managed to shock the Goatse guy.

#### Explanation:

The term Trolling is used to describe provocative, destructive, or annoying behavior on the Internet. Especially common are Internet pranks of the bait-and-switch type, an example of which is Rickrolling. It involves placing a link that is supposed to contain interesting or funny material, but instead directs to the music video of the 1987 Rick Astley song *Never Gonna Give You Up*. The prank first occurred in May 2007 on the popular imageboard 4chan and has since become a widespread internet meme.

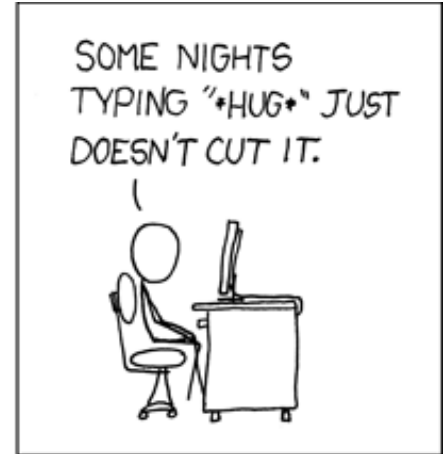
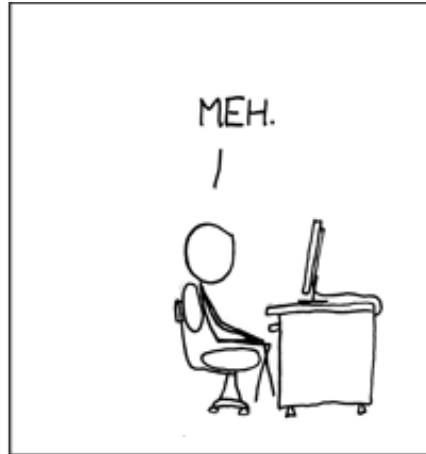
The comic has Black Hat and Cueball digging into the ground and splicing Black Hat's computer into the TV cables of Rick Astley's house. They are feeding the video of *Never Gonna Give You Up* into Astley's TV signal, who can be seen sitting in his living room and wondering why CNN has been replaced by his own video. The act of Rickrolling Rick Astley himself is declared to be a "great moment in trolling".

The title text mentions Goatse.cx (pronounced goat sex), a former shock website that was used in a similar prank. People clicking on the feigned link would instead see the disturbing picture of a practitioner of anal stretching. The title text suggests that Black Hat and Cueball somehow made the (unknown) founder of the site click on an even more shocking link, or possibly put him in the personal presence of anal stretching.



Also note that the comic image itself is itself a Rickroll. Anyone curious enough as to why their mouse pointer became the selection icon to click on the comic (on the original xkcd page) would find themselves watching "Never Gonna Give You Up."

## #352: Far Away



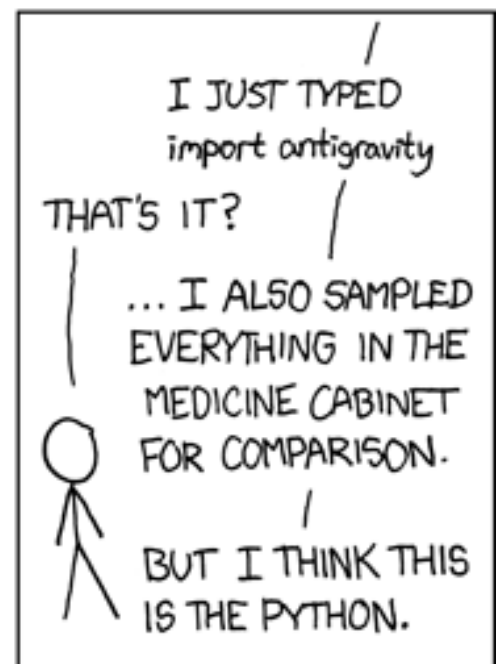
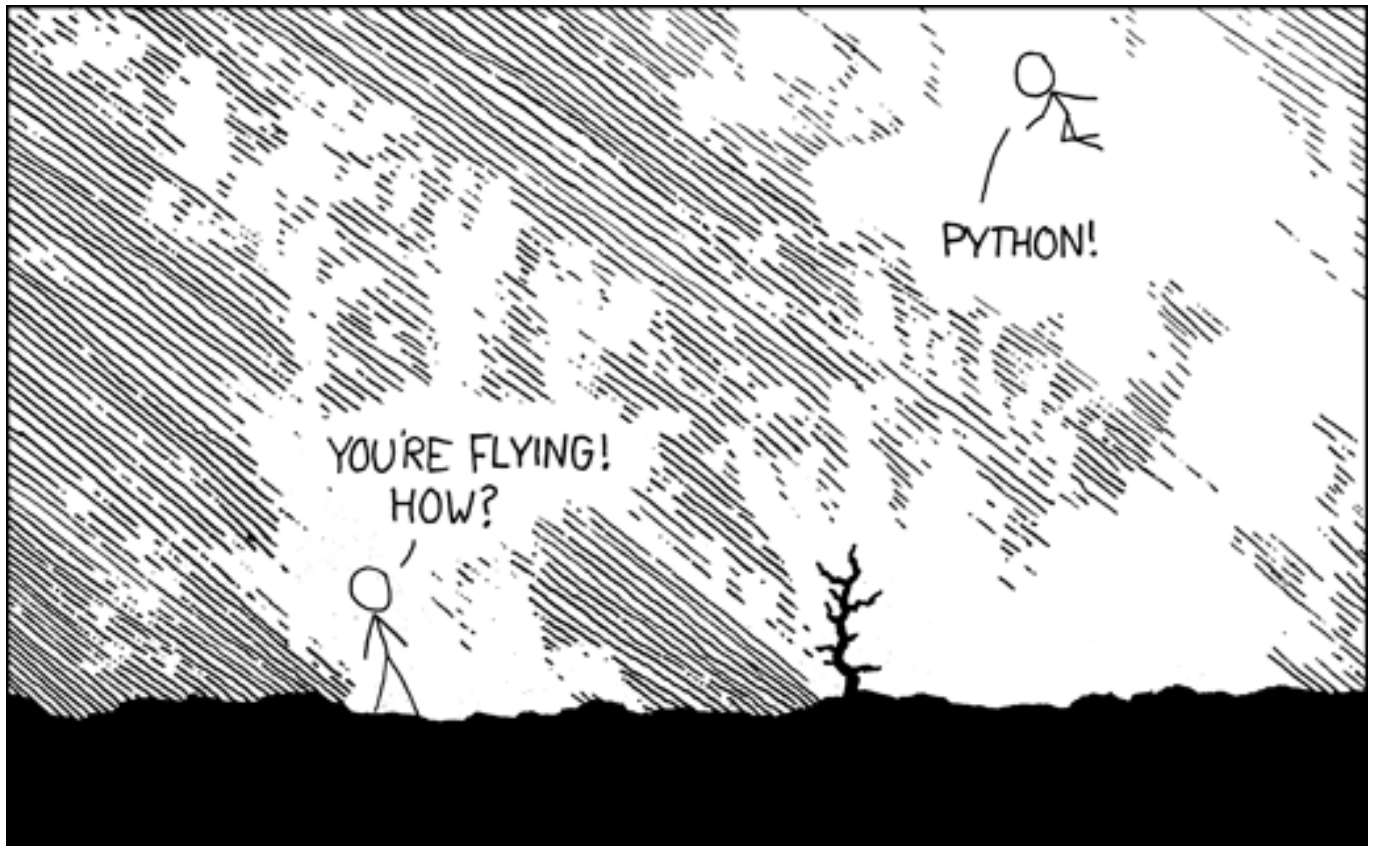
Sometimes an impulsive 2:00 AM cross-country trip is the only solution.

### Explanation:

Cueball and Megan are in a long-distance relationship; to overcome the distance that separates them, they're keeping in touch with an instant messenger. Because their contact is limited to text, they have to write out the actions they wish to enact. Cueball is frustrated with the limitations of these place-holding phrases and longs for physical contact, going so far as to imagine himself hugging Megan in the messenger window.

In the title text, Cueball suggests that, sometimes, the only way to end his frustration is to travel across the country and see her face-to-face.

## #353: Python



I wrote 20 short programs in Python yesterday. It was wonderful. Perl, I'm leaving you.

### Explanation:

Python is a programming language designed specifically to make it easy to write clear, readable programs. Flying is often used as a metaphor for freedom and ease, and here Randall shows Cueball literally flying in response to using Python.

A "Hello, World!" program is a very simple program that prints the phrase "Hello, World!", used in textbooks to illustrate a given programming language. While this sounds simple, it can be nontrivial in some programming languages where you need to explicitly import a library that contains the print function (for instance, in C you need to begin with `#include <stdio.h>`) or do complicated things with classes and variables (see the Java "Hello, World!" for one example). Python doesn't need any of that: `print("Hello, world!")` (or in Python 2, `print "Hello, world!"`) really is all you need to do.

Dynamic typing and significant whitespace are two controversial features of Python, which make some people—like Cueball's friend—hesitant to use the language.

Dynamic typing means that variables do not have types (like "list of short integers" or "a bunch of letters"); any value of any type can be placed in any variable. Dynamic typing allows for more flexible languages, but it means that certain kinds of errors (like trying to subtract a letter from a number) can't be caught until a program is run, and some people think this is too dangerous for the tradeoff to be acceptable.

Whitespace is a string of invisible text characters, like spaces or tabs. In programming, blocks of code controlled by a statement are usually indented under that statement. Most languages require you to use braces (`{...}`) or special keywords (`BEGIN...END`) to delimit these blocks; in Python, the indentation itself is the delimiter. Many Python programmers find that this makes code more readable, but many other programmers find it too "magical" and don't trust it.

Classes, functions, and constants in Python are packed into modules. To use a module, you write `"import module"` at the top of your source file (you can do this anywhere in the file, but it's usually at the top so you can use the module throughout the code). Python comes with a very powerful standard library of modules to do everything from parsing XML to comparing two sets of files for differences, and new modules can be easily installed from the PyPI repository, which has more than 400,000 more to choose from (as of September 2022). Cueball can fly because he imported the `antigravity` module. Python still works for Cueball in 482: Height.

In the final panel, Cueball admits that his ability to fly may actually be because he has "sampled everything in the medicine cabinet," though he's sure it is the Python anyway. An implication of this is that ingesting everything in the medicine cabinet has given him the feeling of freedom and ease that "flying" represents - or that he is hallucinating himself flying and having a conversation with the other character about it. Here, the metaphor of "feeling like you're flying" while using Python is transformed back from being literal (Cueball is actually flying) to being metaphorical (Randall feels like he is flying because Python is so easy to use... or because he had too many strange drugs).

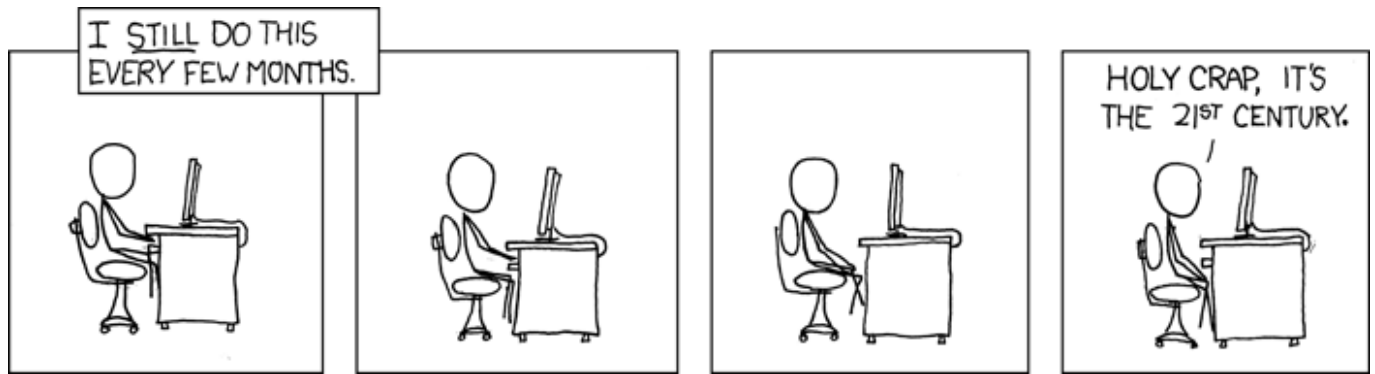
Perl, mentioned in the title text, is another programming language with the same target audience as Python, as both are high-level, general-purpose, interpreted, dynamic programming languages.

However they strongly oppose each other in their language design:

- Perl's philosophy for its syntax is "There's more than one way to do it," so each coder can choose their own coding style to do exactly the same thing.
- Python's philosophy for its syntax is "There should be one — and preferably only one — obvious way to do it," so the written code is more consistent.

Since he has discovered Python, Randall doesn't like Perl anymore, probably because its syntax is less consistent or perhaps due to his problems with Regular expressions. What God has to say about Randall's renunciation of Perl has not yet been documented.

### #354: Startling



We actually reached the future about three years ago.

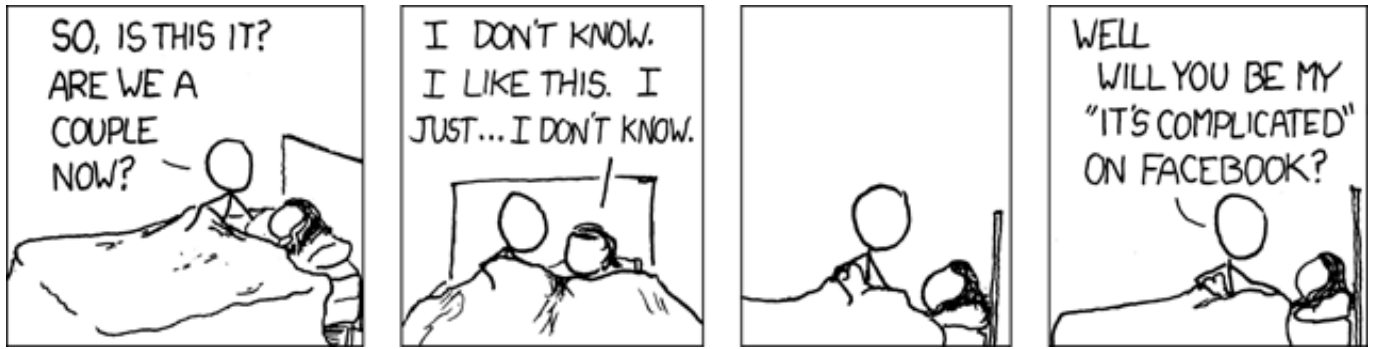
#### **Explanation:**

Cueball is startled every few months when he, again, realizes that he now lives in the 21st century. When he grew up as a child, the year 2000 seemed very far away — it was the future, but he now exists in that timeframe with the rest of society.

The title text states that "the future" was reached in 2004... Three years before the comic was published. This is possibly a joke on how time works, as "the future" is always, was always, and will always be ahead of the time you're in. There may, however, be a reference to some movie set in the future year 2004....

The 21st century, even the year 2004, was futuristic for people growing up in, for instance, the eighties. This view just belongs to the perspective of people — for people growing up in the '70s, even the novel 1984 was futuristic.

### #355: Couple



Facebook defines relationships. 'Yeah, we would have broken up last night, but the net connection was down.'

#### **Explanation:**

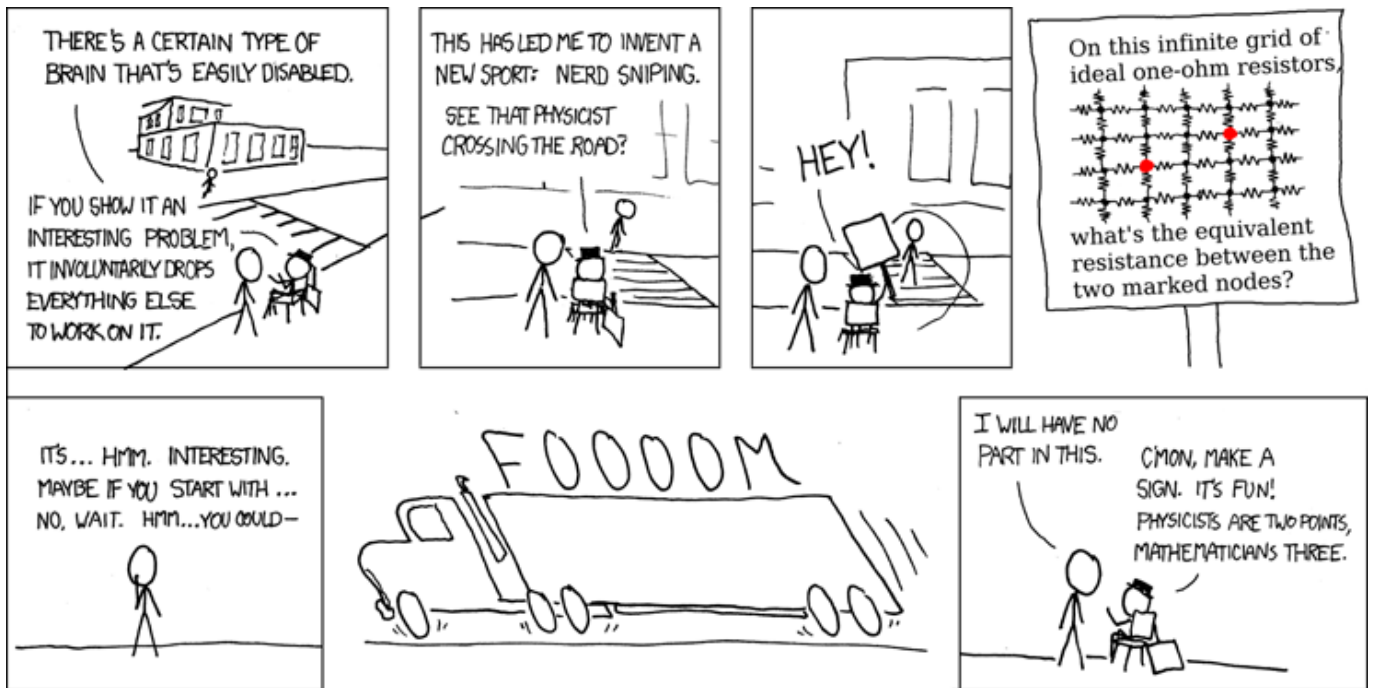
It's hard to know when you are in a relationship in modern times. In olden days, you might fancy a girl, then ask her father if you might court her, and if he granted his permission, you would be a couple. Today, that kind of structure and formality is considered antiquated in most western cultures; as a result, we don't have any of the straightforward cues.

This comic suggests that "making it Facebook official," which means asserting the existence of a romantic relationship on Facebook by setting one's status to "In a relationship," has by 2007 become a way to define when you are a couple. Cueball would like to do it, probably after having sex for the first time with his love interest, to get confidence in his relationship and/or show it off to his friends. Because his love interest isn't so sure about that relationship, or doesn't like to formalize it and prefers to enjoy without thinking too much about it, he suggests a compromise: using the "It's complicated" status instead. And he does so with a phrasing very reminiscent of a formal way to propose to marry someone ("Will you be my wife?").

The title text takes it a step further, suggesting that Facebook has become the only reliable way to know about relationships — even so, without access to Facebook, relationships can't evolve.

When this comic came out in late 2007, Facebook was not even 4 years old, but very popular among young people, who would share their lives in great detail back then. As of 2019, most people are more hesitant about instantly sharing all details of their personal life publicly.[citation needed]

## #356: Nerd Sniping



I first saw this problem on the Google Labs Aptitude Test. A professor and I filled a blackboard without getting anywhere. Have fun.

### Explanation:

Nerds have a way of getting distracted easily and focusing on one thing and ignoring the rest, when they feel their specific skills are challenged by an interesting problem. Black Hat has decided to make this into a disturbing game of getting nerds, in this case a physicist, to stop in the middle of a street and get crushed by traffic by showing them an interesting problem to solve. (This may be based on a real event—see the trivia section).

The problem Black Hat shows is an electronics engineering thought experiment to find the resistance between two points. In normal wiring, a one-ohm resistor would result in one ohm of resistance. Two resistors connected in a series, where electricity has to go through each, has two ohms of resistance. Two one-ohm resistors in parallel give the circuit only half an ohm since you have a conductivity (inverse resistance) that is the sum of the conductivities of the path (1 ohm of resistance is 1 siemens of conductance, thus over two paths is 2 siemens or 0.5 ohms). With an infinite grid of equal resistors, you have an infinite number of paths to take, and for each path an infinite number of both series and parallel paths to consider, so much more advanced methods are needed. The exact answer to the question is  $(4/\pi - 1/2)$  ohms, or about 0.773 ohms. See Infinite Grid of Resistors.

Black Hat explains the concept of his new sport, Nerd Sniping, to Cueball while killing the physicist, but Cueball is appalled and will have no part in this sport, which doesn't make Black Hat give up on him as he suggests it would be fun if he made his own sign. Black Hat finally suggests that "physicists are two points, mathematicians three." This may indicate that he considers a mathematician to be a more difficult target for his game than a physicist would be. It is unclear whether this is meant as a dig on physicists or on mathematicians; it might be because physicists are interested in a wider range of problems, or because mathematicians require a higher-quality problem to hold their



interest. Alternatively, he just dislikes mathematicians more, and is thus willing to award more points for sniping one of them.

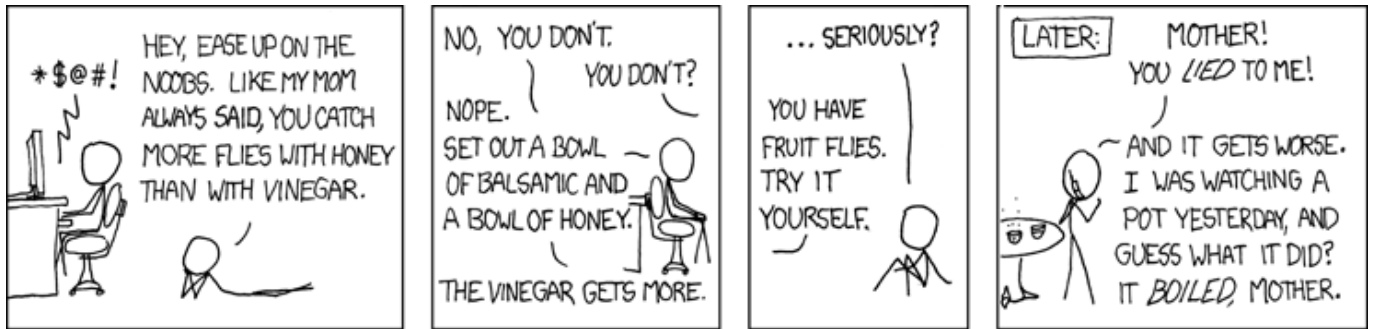
In the title text, Randall explains that he saw this problem in a Google Labs Aptitude Test. This is a collection of puzzles published by Google as a parody of tests such as the SAT. Google is known for using logic & math puzzles in their job interviews.

Randall explained in a speech at Google five days before this comic was released that he was nerd sniped, in a way, by that problem in this test (see problem 10 on page 2), and got quite irritated when he ultimately found that it was actually a modern physics research problem, requiring very advanced math, far more complicated than the other puzzles. Putting such a problem in an aptitude test can be a way of testing if someone might realize when they cannot solve a problem and remember to move along to the other problems. If they fail to do this, they will never reach the easier problems that come later, and will fail due to their inability to realize when they will come up short. This is also important knowledge to have about yourself. Seen in this context, it is not necessarily a bad idea to have such an impossible problem in an aptitude test, as it is disadvantageous to have someone who is easily nerd sniped working for you.

Note that the truck should have stopped no matter what, since the nerd was walking on a pedestrian crossing. However, the driver may have seen him walking, then estimated that he would be safe before reaching him and realized too late that he had stopped in the street. Alternatively, the truck driver is part of Black Hat's sport, or was also nerd sniped by the sign.

Randall has later referred back to the concept of Nerd Sniping several times in the past, such as in the title text of 730: Circuit Diagram, and in the what if? blog. In Visit Every State (7 years after this comics release), the entire comic was shown at the top and the truck again further down the post—Randall has again been nerd sniped by a paper he read. This also happens to him in Lunar Swimming—see the title text for the second to last picture.

## #357: Flies



I don't know about houseflies, but we definitely caught a lot of fruit flies with our vinegar bowl. Hooray science!

### Explanation:

The saying "you catch more flies with honey than vinegar" means that people are more likely to be won over with politeness than hostility.

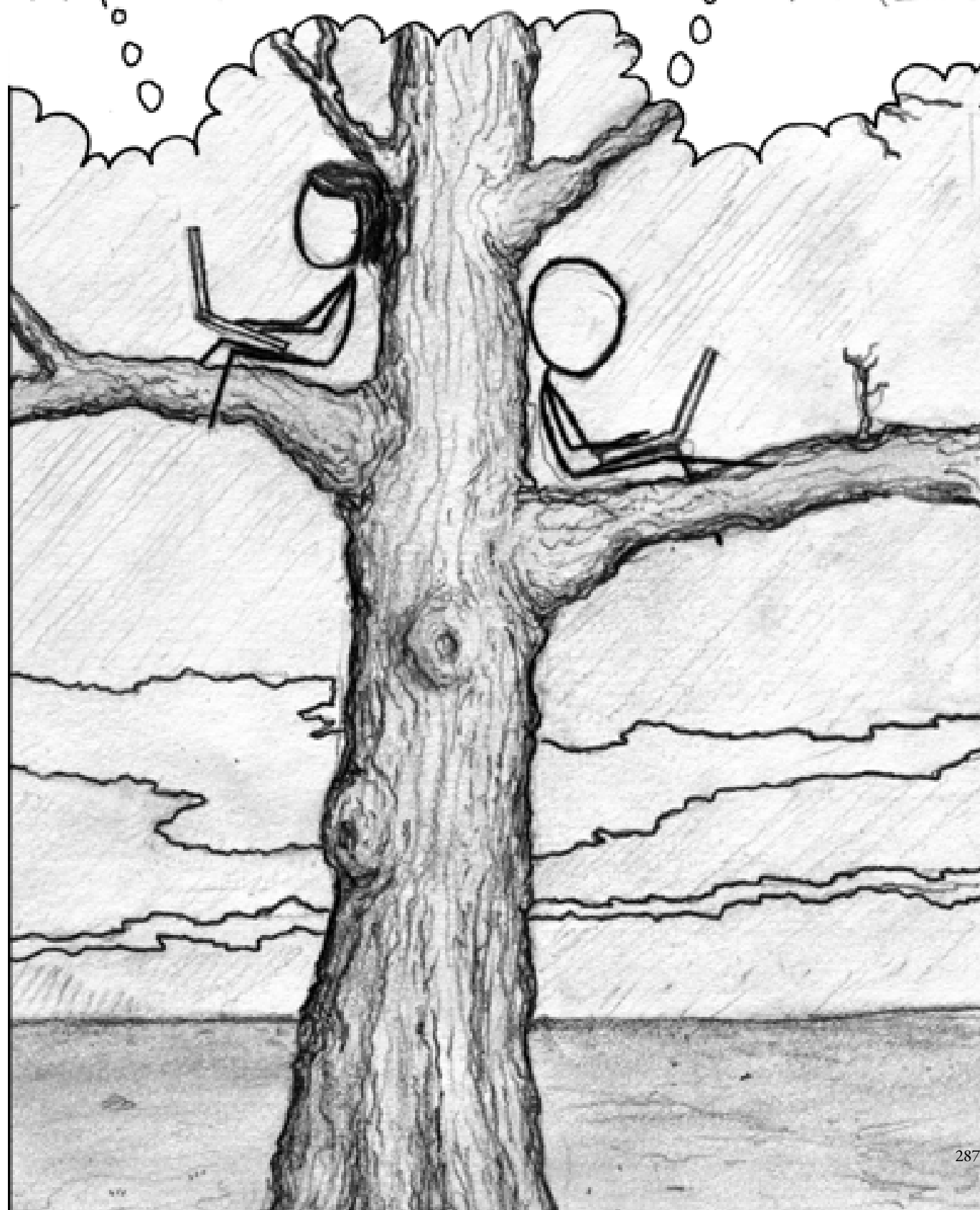
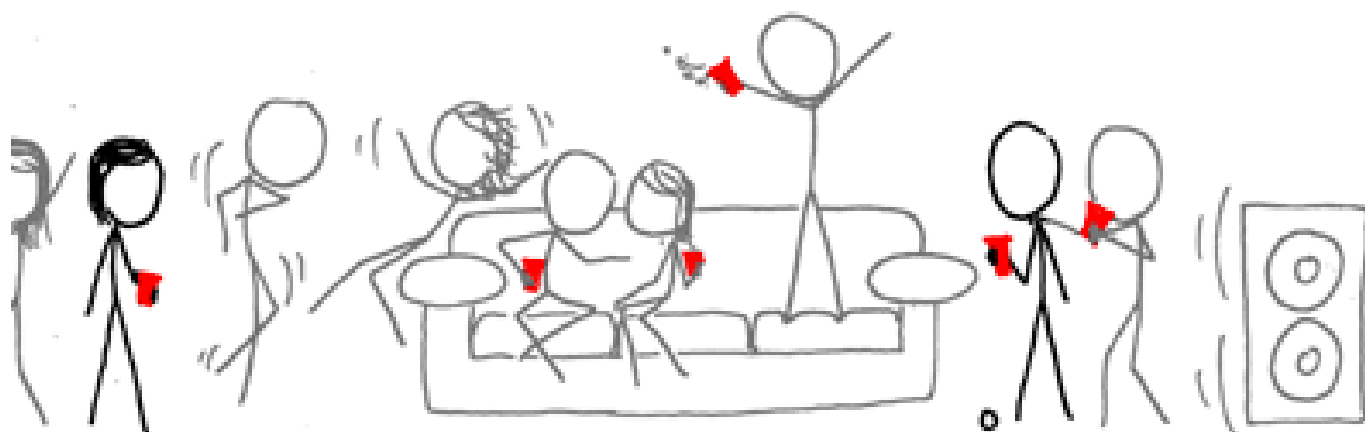
When Cueball's friend tells him this after he replies to a "noob" using swear words, he then says that the saying is literally false by saying that balsamic vinegar attracts more flies than honey. He then tells his friend to try it with his own fruit flies. Fruit flies are attracted to the products of fermentation, particularly to ethanol and acetic acid. The acidity in vinegar is due mostly to acetic acid.

When Cueball's statement is found true, as balsamic vinegar smells like sweet and decomposing fruit to the fruit flies, his friend complains to his mother (with a vitriol influenced by Cueball, perhaps to get some favor) that she lied to him. He then says that another saying, "a watched pot never boils," is also literally false. That saying means that an event that is monitored with impatient attention will seem to take longer, much like watching a clock. However, the pot will boil eventually, so if you keep watching it continuously, you are bound to see it boil at some point.

In the title text, it seems that Randall explains why he wrote this comic — his vinegar bowl attracted a lot of fruit flies. However, he has not done the experiment with houseflies.

The notion of a watched pot not boiling is ascribed to Benjamin Franklin under the pseudonym "Poor Richard." He writes, "a watched pot is slow to boil," meaning "Time feels longer when you're waiting for something to happen."

## #358: Loud Party



I'm glad this is so much fun because I'm not sure how we're getting down.

**Explanation:**

The comic depicts an average everyday scene - a party, with drinks, dancing, and a lot of commotion going on (hence the title). Amid the chaos, though, there are two people, Megan and Cueball, staring wistfully at each other. They both think of the same scene: the two of them sitting on branches of a large and bare tree, doing something on laptops. The implication is that these two people are different - they don't derive their enjoyment of life from parties or other typical teenage activities, but rather simpler, more quiet activities. This is evidenced by the fact that everything other than Megan and Cueball (and the Red Solo cups) are grayed out.

The title text presents a simpler joke - it is rather difficult to get down from a tree, especially when carrying a fragile item like a laptop. It may also refer to the design of the tree that has been drawn, as it lacks (visible) branches below Cueball's perch.

## #359: Rock Band



I'm gonna have to add something to the strum bar so it makes a clicky sound like the old controllers. I'm so used to the feedback; the silence throws me off.

### Explanation:

A smug Cueball demeans his friends' fun experience on Rock Band, a video game which allows players to simulate playing real songs, as if in a real band. The oblivious "band" keeps rocking out, and it transpires that his real purpose is not to spread knowledge but to ruin others' fun (to no avail, thankfully).

The title text is a comment on haptic feedback, comparing the guitar controllers of Guitar Hero, which make a clicking sound when the user strums, with those of Rock Band, which do not click.

### #360: Writers Strike



He's just jealous because everyone's up in the attic listening to Stephen Colbert.

#### Explanation:

From November 5, 2007 to February 12, 2008, the Writers Guild of America, East and the Writers Guild of America, West labor unions that represents film, television, and radio writers working in the United States went on strike as they sought increased compensation for their members' work. Virtually all scripted American television shows shut down in mid-December, with many low-level production staffers being laid off.

In late December and early January, late-night talk shows did eventually return, most of them without writers. But as of the date this comic was written, the popular Comedy Central political comedy shows, *The Daily Show* with Jon Stewart and *The Colbert Report*, were still off-air.

Cueball and Black Hat both admit that they're pretty bummed about having to go through an election season without Jon Stewart's insightful commentary, but Black Hat has corrected that problem by kidnapping Stewart, putting him in the basement, and occasionally soliciting hilarious opinions. Of course, Stewart is rather traumatized by this, and he doesn't have anything to say aside from "Please let me go."

The title text implies that Black Hat also kidnapped Stephen Colbert from *The Colbert Report* and put him in the attic. As opposed to Stewart, who basically played "himself" on the show and was surrounded by zany reporters playing characters, on his own show Colbert played the character of a "well-intentioned, poorly informed high-status idiot." The reference to everyone listening to Colbert, instead, is based on a general opinion that *The Colbert Report*, a spin-off of *The Daily Show*, was superior to the original program.

## #361: Christmas Back Home



Family going to bed at **10 PM** is so much worse than jet lag.

### Explanation:

The script begins similarly to the poem "A Visit from St. Nicholas":

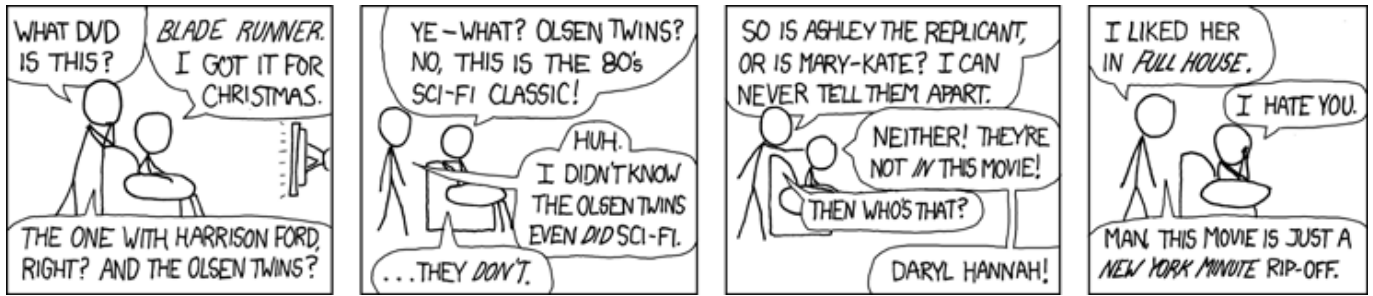
However, there is a change in the text due to the fact that Cueball is on a computer, perhaps coding or on the internet. Instead, it reads

The idea is that Cueball has been so used to being on the computer late at night (perhaps coding, or deep into some Internet argument) and, being Cueball, he's forgotten the hours normal people sleep — such that, when Santa Claus arrives, Cueball is still awake. Note the mouse pun.

The joke of the title text is that being forced to sleep at normal times is compared with jet lag: sleeplessness due to your body being synchronized to another time zone, named as such because jet aircraft made it possible for people to travel farther and faster, throwing their internal clocks out of sync with the place they're in far more than in the age of necessarily longer travel times in which the full clock-shift is smeared over days, weeks or even months. Here, it is implied that Cueball needs to turn back his internal clock over five hours to sync with his family, although it may simply be that Cueball does not sleep at normal times, instead staying awake for hours on end whilst going down rabbit-holes.



## #362: Blade Runner



Blade Runner: Classic, but incredibly slow.

### Explanation:

Cueball is watching a DVD he got for Christmas (the comic is set on Boxing Day). His friend seems intent to ruin it for him.

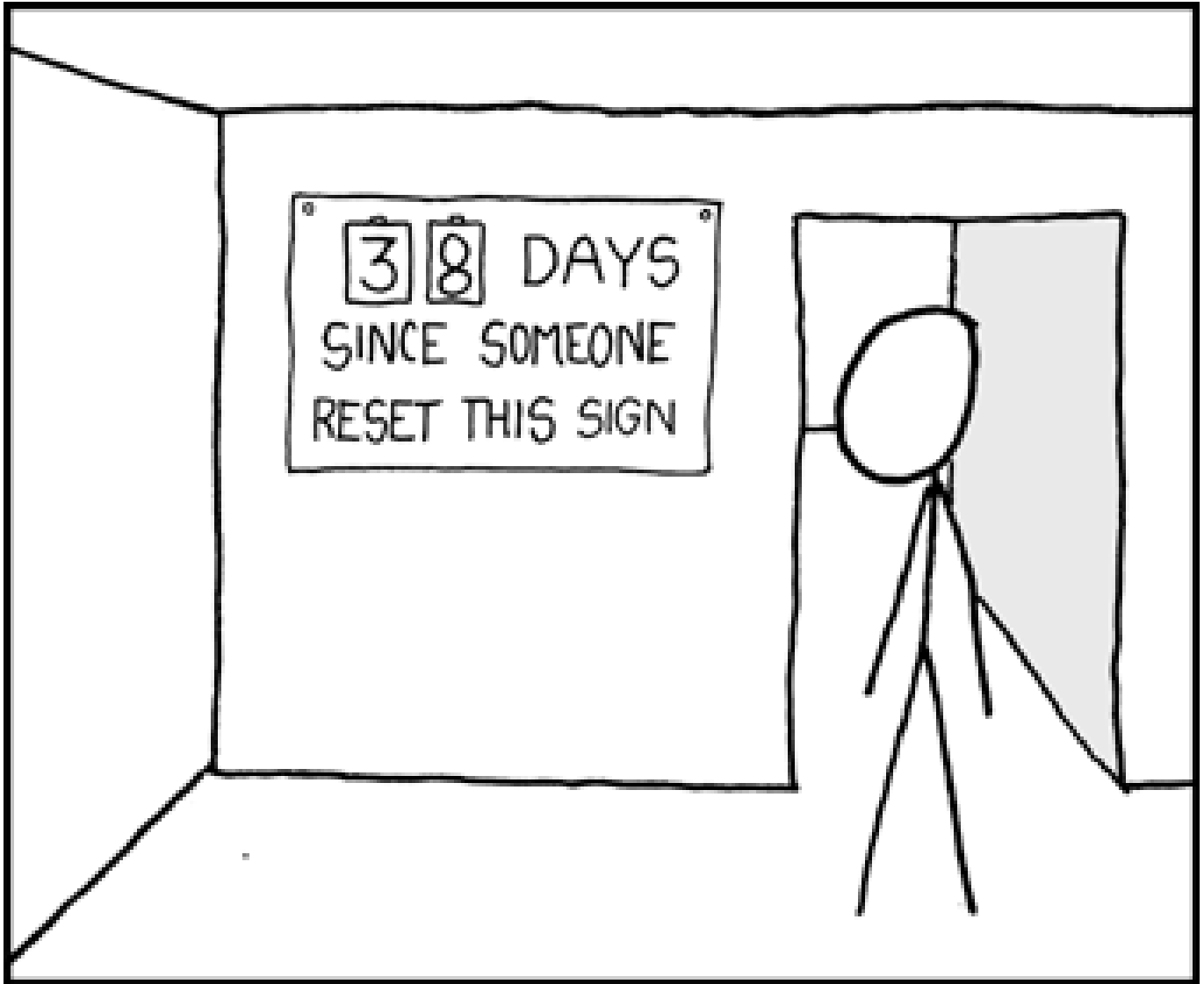
Blade Runner is a famous science fiction movie from 1982 featuring Harrison Ford, and it is now considered a classic. One of the principal characters is played by Daryl Hannah. Hannah later became known for acting in lighthearted rom-com films, such as *Splash* (in which she is a mermaid), similar to the type of films that the Olsen twins are known for. Hannah does look similar to the Olsens, although she is 26 years older, as they were born in 1986 - four years after the movie was released. *Full House* is a TV series, and *New York Minute* is a romantic film both featuring the Olsens. Hannah's character in *Blade Runner* (a homicidal sex robot) is a marked departure from this type of role.

The friend also claims that *Blade Runner* is a rip-off of the 2004 comedy film *New York Minute*. Such a comment is completely illogical — *Blade Runner* came out 22 years prior, and the two films are from completely different genres.

From the above, it is clear that the friend is most likely just trolling (doubly so since *New York Minute* would not be considered very good by people who enjoy sci-fi classics). It could be that he actually believes that these movies came out in the order he discovered them in, although the other guy still hates him for ruining the experience by reminding him of the Olsen twins...

The title text is a common comment on the movie - it's just not like an ordinary modern sci-fi movie. It is also likely a pun on the phrase "instant classic," which is sometimes used to describe movies considered so good that they "become a classic" immediately after release.

### #363: Reset



Clearance for this Sign: 11 Feet

#### Explanation:

A common sight in workplaces is a sign reading '[XX] days since [event]' or '[XX] days without [event]', where [XX] is a two-digit number (indicated using flip cards so it may be easily changed) and [event] is some undesirable preventable occurrence. The purpose of such signs is to inspire employees by proudly displaying how long the event has been avoided or prevented. The most common version of such signs, used in industrial workplaces, displays the number of days since the last workplace accident or injury.

In the comic, the sign says "38 days since the last time someone reset this sign". The term 'reset' is the crux, because while computer-minded people tend to interpret it as 'reboot' or 'set to zero', it also means re-set (with the meaning 'set again'). See definition.

We will call:

reset ~ set to zero --> meaning 1

re-set ~ set again --> meaning 2

Because the sign uses manual flip cards, one cannot add days to the counter without re-setting the sign, which creates a paradox: either you add a day by re-setting it (which, according to the sign, means you'd have to reset the sign) or you don't (in which case the value on the sign would not be valid). The value of the sign cannot be true for more than one day. The value of the sign in the comic (38) can only be true if someone flipped the cards 38 days ago.

The sign is self-referential (which causes the paradox). Self-reference is a recurring theme in xkcd. Examples include 33: Self-reference and 688: Self-Description.

If you only use meaning 1, the sign can be seen as a challenge/invitation.

The title text refers to the signs sometimes hung over roadways in front of bridges that display the clearance of the bridge for the benefit of tall vehicles. However, this one displays only its own clearance, a number that would be unimportant if the sign itself were not there.

### #364: Responsible Behavior



Never bring tequila to a key-signing party.

#### Explanation:

This New Year's comic could play out after Cueball has returned from a New Year's party the day before. (The next New Year's day comic in 2008 was also related to a big party: 524: Party).

In order to send encrypted mail to people, you need to know their public key. You use this key to encrypt the email, and only they can read it (using their private key). However, there is the problem of authentication: how do you know for certain that the key belongs to the person to whom you think it does? It could be someone else masquerading as them, hoping for people to send them sensitive information. They could decrypt and read your mail, and could even re-encrypt it using the genuine public key of the intended recipient, and then pass the message onto them, leaving both you and the recipient unaware of the interception. This is a type of man-in-the-middle attack.

One solution for this is that people sign each other's keys. It works like this: say you want to send an email to Bob, but you've never met him. You find his key online (they are stored on certain servers, like cryptographic phone books), but how can you be sure that it's really his? Well, turns out that you have a mutual friend Alice, and you have her public key and you know that it is hers. If Alice has signed Bob's key with her private key (which only she has access to), it means that she's certain that that really is Bob's key. So then you can be sure that Bob's key is genuine (since you have a common friend, Alice) and that your communications will be safe.

A key-signing party is simply a super-geeky party where people meet in real life so that they can be sure of people's identity, and then everyone signs everyone else's keys. It's a good way to expand the web of trust. The joke here is that he has no idea who this girl is and yet he still signed her key. This is dangerous, because he is vouching for her identity. If he is mistaken, this could result in a serious loss of credibility on his part.

The humor lies in the juxtaposition of what you expect (that they had sex) and what is the case (they signed each other's keys, also known as geek-sex).

The title text appears to be a reference to the "key parties" of swingers in the 1970s, where all members of one sex would throw their keys in a bowl, and all of the other sex

would draw them out, thus being paired off to sleep with the key owners.

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